SEPTEMBER 15, 1918.

WHOLE SERIES, [illegible] No. 9. THIRD SERIES, VOL. XXXIV.

GENERAL LIBRARY
SEP 25 1918
UNIV. OF MICH.

The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

Edited by

H. A. Hare, M.D.

Professor of Therapeutics and Diagnosis in the Jefferson Medical College,

GENERAL THERAPEUTICS,

and

Edward Martin, M.D.

Professor of Surgery in the University of Pennsylvania,

SURGICAL AND GENITO-URINARY THERAPEUTICS.

EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Streets, PHILADELPHIA, PA.

SUBSCRIPTION RATES:

United States and Mexico, one year,	Two Dollars.
Canada, one year,	Two Dollars and Fifty Cents.
Foreign Countries (postage prepaid), one year,	Ten Shillings.

E. G. SWIFT, Publisher, - - - DETROIT, MICHIGAN, U. S. A.

FOREIGN OFFICES:

LONDON, ENGLAND—19 & 20 Great Pulteney St., W. SYDNEY, N. S. W., AUSTRALIA—125 York St.
WALKERVILLE, ONT., CANADA. MONTREAL, QUE., CANADA—118 St. Paul St., W.
BOMBAY, INDIA—70 Hornby Road.

Entered at the Post-Office at Detroit, Mich., as second-class mail matter.

COPYRIGHT, 1918, BY E. G. SWIFT.

An Effective Remedy *for*
Nervous Sleepless Patients

NEURONIDIA

Palatable Well-Tolerated Reliable

Allaying Restlessness and Producing Refreshing Sleep.

Especially indicated in insomnia from mental strain, neurasthenia and other neuroses; also an excellent sedative in sea-sickness.

Literature on Request

Schieffelin & Co.
NEW YORK

Important Therapeutic Indications in Diseases of the Urinary Tract

Fulfilled by

URIFORM

Highly recommended in the treatment of

CHRONIC URETHRITIS **VESICAL CATARRH**

PROSTATITIS **VESICULITIS**

PYELITIS

BECAUSE:

It sterilizes the Urine
Arrests Discharge
Reduces Congestion
Allays Pain

DOSE: One to two teaspoonfuls three times daily.

Literature and Sample on request.

Schieffelin & Co.
New York

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Issued on the 15th of each month.

E. G. SWIFT, *Publisher.* HARRY SKILLMAN, *Business Manager.*

DETROIT, MICHIGAN, U. S. A.

CONTENTS, SEPTEMBER, 1918.

ORIGINAL COMMUNICATIONS.

The Clinical and Pathological Aspects of Alcohol. By H. A. Hare, M.D 609
Ionic Medication in Diseases of the Ear, Throat, and Nose. By Leighton Kesteven, M.R.C.S. Eng..... 613
"Thresher's Fever." By Arthur B. Light, M.D..... 615

EDITORIAL.

The Kidneys, the Blood, and the Diet..... 621
Radium and Hodgkin's Disease..... 623
Transfusion..... 624
The Treatment of Peripheral Nerve Injuries..... 626
Methods of Dealing with Hernia in the Army..... 628

REPORTS ON THERAPEUTIC PROGRESS.

The Clinical Value of Radium..... 619
The Use and Abuse of Heroin..... 630
A Simple Method for the Resuscitation of the Human Heart..... 631
Angina Pectoris..... 632
Anesthesia for Painful Surgical Dressings..... 633
Some Problems in Starch Digestion in Infancy and Childhood..... 633
The Value of Roentgen Rays and Benzene in the Treatment of Polycythemia Vera..... 633
Ether-oil Colonic Anesthesia..... 634
The Treatment of Cancer of the Lip by Radium..... 636
Quinine in the Treatment of Anal Fissure..... 637
Treatment and Prevention of Defective Hearing..... 637
The Collapse Treatment of Consumption..... 638
Technique of Nitrous-oxide-oxygen Analgesia and Anesthesia in Normal Obstetrics..... 639
Report on Neurocirculatory Asthenia and its Management..... 641
Electrocardiographic Depression Produced by Digitalis. 641
Treatment of Malarial Relapse..... 642
The Prevention and Treatment of Malaria..... 643
Treatment of Fibroid Tumors of the Uterus with Radium..... 644
Amebiasis: Its Radical Cure with Combined Emetine and Salvarsan Products..... 646
The Results of Treatment in Pernicious Anemia..... 646
Toxicity of Certain Widely Used Antiseptics..... 646
Paroxysmal Tachycardia..... 647
Cardiac Syphilis..... 647
A Study of the Comparative Number of Successful Vaccinations by the Cross-scarification and the Incision Methods..... 648
The Prevention of Measles..... 648
Behavior of Hypochlorate and of Chloramine-T Solution in Contact with the Necrotic and Normal Tissues in Vivo..... 649
The Hypertonic Infant: The Curative Action of Atropine on Certain of its Manifestations..... 649
The Pupilary Reaction in Chronic Alcoholism and Alcoholic Psychoses..... 650
The Status of Tonsil Operations..... 651
Investigations on the Composition of Oil of Chenopodium and the Anthelmintic Value of Some of its Components..... 652
Pneumonia at Base Hospitals..... 652
Prophylaxis of Pneumococcic Infection..... 653
Sarcoma of Shoulder Successfully Treated by Radium... 654
The Bad Habit of Vaginal Douching..... 655
Antitetanic Serum, Clinical and Experimental..... 657
Nitrous Oxide Analgesia in Obstetrics..... 658
A Pharmacological and Therapeutic Study of Benzyl Alcohol as a Local Anesthetic..... 659
The Value of Amyl Nitrite Inhalations in the Diagnosis of Mitral Stenosis..... 659
Abortion and its Treatment..... 660
The Treatment of Infected, Especially War, Wounds.... 661
Nitrous Oxide Anesthesia..... 662
Surgical Treatment for the Cure of Chronic Suppurative Otitis Media in Childhood..... 663
Muscle Contracture Following Injury..... 664
The Importance of Recognizing the Weakness or the Obliteration of the Conjoined Tendon in Operations for Inguinal Hernia..... 666
Treatment of Flatfoot..... 666
Method of Citrated Blood Transfusion..... 667
Destruction of the Nits of the Clothes Louse by Solutions of Cresol-soap Emulsion and Lysol..... 668
Excision of Gunshot Wounds..... 669
Barany Chair Tests and Flying Ability—a Correlation Study of One Hundred Naval Aviators..... 669
Lymphatic Diseases in Children Simulating Appendicitis 670
Postoperative Obstruction..... 670
The New Method of Joint Formation in Arthroplasty.... 671
The Pneumogastric Symptom..... 672
Treatment of Septicemia by Passive Intravenous Injections of Saccharated Serum..... 672
A Specific for Every Pathogenic Micro-organism..... 673
Fistula in Ano..... 674
Liquid-tight Closure in the Treatment of Wounds..... 675
Primary Cause of Shock..... 676
The Association of Pruritus with Pyorrhea Alveolaris... 677
Scalp Flaps and Depilation in Plastic Surgery..... 677
Cerebral Edema: Its Causation and Treatment..... 677

REVIEWS..... 679

NOTES AND QUERIES.

The Influenza Pandemic..... 681
The Reducing Body in the Cerebrospinal Fluid..... 682
Nurses Cannot Legally Give Anesthetics in West Virginia 683
The Beginning of Dispensaries..... 684

CORRESPONDENCE.

The First Use of Wafers in Medicine..... 684

EDITED BY

H. A. HARE, M.D., GENERAL THERAPEUTICS.

EDWARD MARTIN, M.D., SURGICAL AND GENITO-URINARY THERAPEUTICS.

EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Sts., PHILADELPHIA, PA.

Editorial communications should be addressed to the Editors, N. W. Cor. 18th and Spruce Streets, Philadelphia, Pa. Articles intended for the Original Department will be accepted only with the understanding that they are contributed to this journal exclusively. Authors will receive reprints in pamphlet form, without charge, providing the request for them is written on the margin of the articles submitted.

SUBSCRIPTION RATES:

United States and Mexico, one year, - - - $2 00 | Canada, one year, - - - - - - - - - $2 50

Foreign Countries (postage paid), one year, 10/-

Foreign subscriptions may be forwarded through

THE THERAPEUTIC GAZETTE, 19 and 20 Great Pulteney Street, W., London, Eng.

MR. H. K. LEWIS (Medical Publisher and Bookseller), Agent, 136 Gower Street, London, W. C.

THE THERAPEUTIC GAZETTE, 125 York Street, Sydney, N. S. W.

THE THERAPEUTIC GAZETTE, Walkerville, Ontario, Canada.

THE THERAPEUTIC GAZETTE, 378 St. Paul Street, Montreal, Canada.

Address all business communications to

The Therapeutic Gazette,

743-747 Atwater Street, East, (P. O. Box 484) DETROIT, MICH., U. S. A.

AMERICAN-MADE "SALVARSAN"

(ARSPHENAMINE)

(Dioxydiaminoarsenobenzene Dihydrochloride)

(Ehrlich's "606")

THE Federal Trade Commission has granted license for "Arsphenamine." Under this license we are producing the product identical in every way with the **Salvarsan** which we formerly imported and which conforms in every detail to the standards set by the late Professor Dr. Paul Ehrlich, and is made according to the processes used at the Hoechst works.

In addition to the tests prescribed and made by the Hygienic Laboratory of the Public Health Service, our product is tested by the head of the Department of Biological Chemistry in one of our leading university medical schools, who bears the same judicial attitude to our preparations that Prof. Ehrlich did to the standard German preparations. He subjects them to biological tests, in addition to those prescribed by the Public Health Service, which are more rigorous and comprehensive than those adopted for this purpose by Professor Ehrlich himself. These tests are made and reported upon before the product is submitted to the United States Public Health Service, thus insuring a double and absolute check on every lot turned out.

Our product is being marketed under the name **"Salvarsan."** As the product of other makers is being sold as "Arsphenamine" also, to insure receiving our product order either

SALVARSAN

or

ARSPHENAMINE—"METZ"

H. A. METZ LABORATORIES, Inc.

122 Hudson Street, NEW YORK

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE.

Whole Series, Vol. XLII. | DETROIT, MICH., SEPTEMBER 15, 1918. | Third Series, Vol. XXXIV, No. 9.

ORIGINAL COMMUNICATIONS.

THE CLINICAL AND PATHOLOGICAL ASPECTS OF ALCOHOL.[1]

BY H. A. HARE, M.D.,

Professor of Therapeutics and Diagnosis in the Jefferson Medical College.

I am not sure that the point of view which I shall discuss is appropriate for presentation to a society devoted to the study of pathology. If such a society is intended to deal solely with morbid anatomy, then my paper is distinctly out of place, but if, as is the case, the word is meant to indicate abnormal physiology or the study of diseased but living tissues, then what I have to say has a chance of being appropriate.

I regret that the committee in charge of the programme has not been able to arrange for some one else, as a referee or co-referee, to take up the question of the deleterious effects of alcohol as to tissue change, because I believe, at the present time, a paper dealing with this aspect of the matter would be singularly timely. Recent researches, which I have not time to consider, have, I think, indicated that alcohol is not as deleterious an agent as some persons have believed; that where pathological changes take place in the heart, liver, kidneys, and blood-vessels, alcohol often is considered the culprit when, in reality, it is entirely innocent, or only indirectly responsible; and the more recent researches have, I think, indicated that it is questionable as to whether cirrhosis of the liver is produced by alcohol as the sole agent, although alcohol in excess over a long period of time, naturally, would cause pathological changes in any tissues with which it came in contact in concentrated form, as is the case with the liver.

[1]Read before the Philadelphia Pathological Society.

I wish at this point to have it clearly understood that I am not discussing the whole subject of alcohol. If one takes up a medical journal and sees an article headed "Pneumonia," he is fairly safe in failing to read that article, since he knows that it is probably not worth reading. Those who are really in the possession of valuable facts concerning this disease find more than they can adequately discuss in dealing with one of its phases. So with alcohol. I have yet to attend a meeting at which the drug was discussed in which it was not dealt with in all possible phases, with the result that those in attendance have gone home with their minds filled with conflicting views and uncertainties.

It is not my intention to discuss the subject of alcohol in its bearings upon public health or social existence, but rather to boldly assert that, like all other drugs which possess definite therapeutic power in proper use, it is equally powerful to do harm if improperly used. Furthermore, that this definite therapeutic power is not limited, as in the case of certain other drugs, to conditions of disease, but that it can be used with advantage by those who are in health, under certain circumstances and limitations. That when abused it is capable of doing harm immediately, or at a remote time, no one can deny; but this holds true of every other drug, and even of such common articles as salt and water.

It is the function of the medical profession to gather together scientific facts, reach

definite conclusions based on its use of that drug, and, upon reaching such conclusions, be prepared to give sensible advice to the laity.

For many years alcohol was universally considered as a stimulant. Finally, a long series of scientific investigations proved that this was an entirely erroneous conception of its powers, and therefore the investigators, who found it to be a sedative and depressant, at once jumped to the conclusion that its employment in medicine was erroneous, when, in reality, the correct conclusion is that its employment in medicine is correct, but that our conception heretofore as to how it did good was incorrect. If, therefore, we accept, as we should, the conception of alcohol as a sedative and as a vascular relaxant, it is not difficult to understand how, under certain circumstances, its use is advantageous. With a unanimity which is remarkable, scientific investigation has shown clearly that alcohol, in suitable doses, is speedily oxidized in the body and lends force to the economy, and, by its ready oxidation and utilization, prevents tissue waste, with the result that in diabetes, typhoid fever, and certain cases of tuberculosis, where nutrition is gravely impaired, it may be used with distinct advantage as a tissue protector and as a nervous sedative.

In certain diseases like typhoid fever, where circulatory disorders are induced by toxemia, it not only acts by being burnt up in the body and protecting tissues, which would otherwise be destroyed, but by its ability to relax the peripheral vessels aids in the restoration of circulatory equilibrium. A notable illustration of this power of alcohol is seen in its employment after a Brand bath in typhoid fever when the extremities of the patient are cold and when alcohol is used to produce what we call reaction. Under these circumstances it relieves internal congestion and floods the peripheral circulation with blood, which is thereby cooled through coming in contact with the surface of the body. So, too, it is the universal experience of human beings that after exposure to cold for a length of time, with resultant internal congestion, the administration of alcohol drives the blood to the surface, overcomes the congestion, and warms the extremities. It at once becomes clear that the use of alcohol which will send the blood to the surface prior to or during exposure to cold is most unwise, but its employment afterward may be most useful.

From clinical observation I became convinced many years ago that alcohol had a distinct value in combating that condition which is commonly known as sepsis, and in order to determine that this clinical view was supported by experimental evidence, I carried out a series of experiments in cases of typhoid fever and tuberculosis, which seemed to prove that alcohol distinctly improved the bacteriolytic power of the blood serum. The technique employed was suggested by Dr. Flexner, and was carried out by a bacteriologist while I administered the alcohol and watched the patients. As the bacteriologist who made the tests did not know the source of the blood, the object of the experiment, nor which sample of blood came from the blood of the patient who was receiving alcohol or the patient who was receiving no alcohol, the factor of imagination as a factor of error was eliminated. The common practice of eminent surgeons and physicians who thirty or forty years ago gave alcohol freely in cases of septicemia, when these conditions were so frequently met with, seems to have justification either through the direct or indirect effect of the drug.

When it comes to the employment of alcohol by those who are in health the problem is far removed from the standpoint so far discussed. Here its ready oxidation, when tissue waste would otherwise be normal, stands in the way of normal oxidation processes. The body oxidizes the substance which is easy of oxidation and fails to utilize and oxidize ordinary foods more difficult of oxidation. Placing more coal in the grate, in which the coal is nearly burned out, accomplishes a useful purpose, but placing an easily oxidized fuel, like oiled cotton waste, on top of live coals does

not improve the fire in the grate, but, to use the words of the engineer, "baffles" the fire upon which he wishes to depend. But here, again, a distinction is to be made between the individual who is in a perfectly normal state and the individual who is fatigued or worn out by nervous or physical stress It not infrequently happens that such an individual has not the energy with which to digest and utilize ordinary foodstuffs with anything like normal ability, and the use of small quantities of alcohol, which by their irritant properties stimulate absorption, and which, being burnt up readily, give temporary energy to the body, enables a man or woman to take in and utilize the foodstuffs which are really needed, at the same time benumbing the nervous irritability and producing a condition of mental relaxation which is distinctly advantageous. Alcohol taken in youth when nutritional processes are unimpaired is usually harmful. Alcohol taken by those devitalized by old age or disease is advantageous. Youth needs no artificial food or nervous sedative. Old age often needs something to support the system and make life easier.

I fully appreciate that this is one of the aspects of the use of alcohol which may possess danger if the drug is used by some one who lacks normal self-control, and that in such a person the alcoholic habit may be induced; but this does not seem to me a good reason for withholding alcohol from that immense majority of human beings who can use it in moderation with perfect safety.

When we come to a consideration of the pathological effect of the too free use of alcohol upon mentality, the question at once arises as to how much the conditions which develop are due to prealcoholic tendencies and how much the alcohol is to be considered as a primary factor. One of the most able papers on this subject was recently written by Patrick, professor of philosophy in the University of Iowa, who points out that the American people are now consuming 2000 million gallons of alcohol, 500 million pounds of tobacco, 1000 million pounds of coffee, and nearly 100 million pounds of tea annually, and states that these substances are not taken as luxuries or evidences of vice, but because they fulfil certain indications which the vast mass of humanity instinctively recognizes as in existence. Such persons do not employ these drugs with the idea of abusing them, but because they find comfort in their use, and in the case of alcohol, as Patrick puts it, "a temporary quietus is placed upon the higher brain centers and so a release from the burdens of modern strenuous life is obtained."

In this connection it is interesting to note that White, superintendent of the Government Hospital for the Insane, in Washington, believes that alcohol is not a habit-forming drug, but that alcoholism is a symptom of some underlying functional condition, and quotes Haycraft, who, after making a statistical study of the effects produced by prohibition in several States, found that as the consumption of alcohol had diminished drunkenness the list of admissions to the insane asylums and poor houses progressively and correspondingly increased. Or, to put it in another way, given a number of mental defectives, these individuals, when unable to indulge in alcohol, nevertheless progressively diminish in efficiency.

White also quotes the President of the Society for the Study of Inebriety as having positively stated that he had never seen an inebriate who, aside from his inebriety, was a normal man. Such an individual, being abnormal, flies to the cover of alcohol to escape the overburdening oppressions of reality.

Whether the use of alcohol to excess by individuals of this type is not a useful thing to the human race in the end in eliminating the unfit is an interesting question for discussion. Much might be cited along these lines if time sufficed. Goddard, who is director of the Department of Brain Research in the Training School for Feebleminded Children at Vineland, N. J., found, for example, that alcoholic human beings average 5.5 children to a mating, and non-alcoholics 4.1 to a mating. Analyzing two

groups, which consist of several thousand children, he found that in the alcoholic group 31 per cent were feeble-minded, whereas in the non-alcoholic only 18 per cent were feeble-minded. At first glance this would seem to indicate that the use of alcohol on the part of the parent was deleterious to the mentality of their offspring, but as a matter of fact it was shown that in the great majority of cases the reason that the parents took alcohol to excess was because they were primarily defective, the alcoholism being due to feeble-mindedness rather than the reverse.

Finally, this important subject may be briefly summed up by endeavoring to hold to the middle of the road in regard to alcohol, as to its usefulness and harmfulness. As Morris has cleverly stated, "alcohol does about everything that its friends claim for it and about everything that its enemies claim for it, depending, however, upon the person who uses it and how it is used."

We must take care in accepting experiments upon animals and healthy men to recollect that these experiments may be fundamentally faulty, and that the conclusions reached from studies upon healthy organisms must not be applied too rigidly to clinical observations made upon unhealthy organisms. As an illustration of this I have already cited the different effect in the metabolism of non-febrile and febrile persons, and as an illustration of an experiment with fictitious results I may cite Stockard's experiments with guinea-pigs. He found that he could not keep guinea-pigs continually under the influence of alcohol when it was administered by the mouth, because of its effect upon the stomach. He therefore kept his guinea-pigs constantly intoxicated by giving them fumes of alcohol. Guinea-pigs are not men, and men do not inhale alcohol every hour for years. He found that he could keep guinea-pigs exposed to the fumes of alcohol almost to the point of intoxication for six days per week for a period of five years; that when these animals reproduced their progeny died soon after birth or were distinctly defective, but he also was unable to find anything abnormal in the heart, stomach, lung, kidney, or other organs that might not be found in a normal individual.

I hold no brief for alcohol. I recognize that its abuse is a curse. I assert that its proper use is a blessing. I am anxious that the medical profession should not take a dogmatic attitude for or against it. Some prohibitionists remind one of what Macaulay said about Puritans, namely, "that they did not object to bear baiting because they pitied the bear, but only because they objected to other people enjoying themselves." Laws controlling the abuse of alcohol can be adequate only when they are founded upon scientific reasoning and not upon fanaticism, and medical men are the only people who can guide legislation wisely. No one can deny that harm results from the abuse of alcohol; neither can any one deny that properly used as a medicine it does good. As scientific men it seems to me that we should avoid doing that which provoked me to write a letter to the *Journal of the American Medical Association,* which letter some of you may have seen. The following statements in it I would like to repeat. The House of Delegates of the A. M. A. passed these resolutions:

> *Whereas,* We believe that the use of alcohol as a beverage is detrimental to the human economy; and
>
> *Whereas,* Its use in therapeutics, as a tonic or a stimulant or as a food has no scientific basis; therefore be it
>
> *Resolved,* That the American Medical Association opposes the use of alcohol as a beverage; and be it further
>
> *Resolved,* That the use of alcohol as a therapeutic agent should be discouraged.

And defeated the following safe and sane resolution:

> The Section on Pharmacology and Therapeutics instructs its delegates to the House of Delegates that it is the sense of this section that the question of the therapeutic value of alcohol which has been long in dispute remains yet undetermined, and that hasty action taken in the stress of present circumstances would not be wise, and would not reflect fully the best therapeutic and pharmacologic opinions.
>
> Furthermore, while recognizing the possible need of prohibition of the use of alcohol as a measure of public safety, it would ask that the two questions be considered separately on their respective merits.

To say that its use in therapeutics as a

tonic, or stimulant, or as a food has no scientific basis is not only unwise, but, in the opinion of many eminent medical men, untrue and not supported by the majority of evidence. Space does not permit of quotations, but it may not be out of place to quote from the last edition of Sollman's "Manual of Pharmacology," particularly as Dr. Sollman is an active member of the Committee on Pharmacy and Chemistry. On page 547 he says of alcohol:

> Its usefulness as a quickly acting stimulant can scarcely be doubted in the various forms of sudden circulatory collapse—syncope, exhaustion, hemorrhage, traumatic shock, snake venom, strychnine, aconite, veratrum poisoning.

And he recommends a dose of approximately 1 ounce of whisky or brandy, preferably hot, repeated every ten or fifteen minutes according to the effect. On the same page he says:

> The vasodilator effect may be useful in angina pectoris, and in chronic lesions of the heart small doses may be valuable to lessen the worries of the patient.

As to its value as a food, Sollman says in discussing exhausting fevers:

"The beneficial effects are probably mainly nutrient, due to the direct *food-value of the alcohol* (italics his), and to the stimulation of the digestion and absorption of the food. The pulse becomes stronger and more regular." On page 549 he states that "if taken after exposure it prevents the tendency to congestion of internal organs," and again, on the same page, he says: "Small quantities of alcohol, taken with meals, therefore, tend to have a favorable action on digestion." Finally, Sollman states that "in chronic conditions good results might be expected in adynamic states where the circulation or tone is defective—in the course of convalescence from fevers or exhausting illnesses."

Dr. Cushny, Professor of Pharmacology in the University of London, England, is the first corresponding member of the Council of Pharmacy, and in his book, page 143, he says, when considering the food value of alcohol:

> The final result of all these investigations is that alcohol can take the place of some of the fats in the food and leads to the same economy of protein as the ordinary non-nitrogenous constituents of the dietary.

On page 150 Cushny says:

> In sudden chill with tendency to fever alcohol is often of great benefit. . . . Its efficacy would seem to be due to the relief of the congestion of the internal organs by the return of the blood to the skin.

The matter may, perhaps, be summed up: (1) Alcohol is a powerful drug and, therefore, if used carefully, capable of doing good. (2) Thousands of physicians prescribe it in illness. (3) Great care should be exercised by a body of men acting as representatives of their colleagues in condemning dogmatically what many of their colleagues believe correct. (4) Such action may jeopardize the reputation of a professional brother.

IONIC MEDICATION IN DISEASES OF THE EAR, THROAT, AND NOSE.

BY LEIGHTON KESTEVEN, M.R.C.S. Eng., Sydney, N. S. W.

This method of treatment, though it has given such very satisfactory results in many affections, has hitherto received but scanty attention in its application to aural and nasal complaints, and there is no class which, judging by the results I have obtained, offers a more definite prospect of satisfactory treatment.

Cataphoresis was recommended for labyrinthine trouble a good many years ago, but seems never to have taken any hold, as it is but rarely, or at best superficially, referred to in any of the recent handbooks, though Morton, Meisner, Scheppegrell, and others directed attention to the possibilities of it and devised various electrodes to attain that end.

Lewis Jones's definition, "Ionic medication is used for the introduction of drugs into superficial parts of the body through the surface, and also for modifying the chemical constitution of parts of the body,

such as the joints, fibrous tissues, or nerves, by the setting up of chemical interchanges throughout their substances," is a clear pointer to the sclerolytic action which I claim renders it of such immense value in obtaining access to the otherwise inaccessible deep tissues of the ear, nose, and throat.

One reason for the lack of tangible results in the application of cataphoresis consists in the comparatively inefficient methods employed. To secure the passage of the ions into the substance of the tissues a sufficient supply of the derivatives of them must be insured—that is to say, a sufficient quantity of the fluid through which the current is to pass and draw its ions from. The mere damping of probes covered with cotton-wool gives no source of supply; the probe most probably retains the greater part of the drug. *Ex nihilo nihil fit;* the results were consequently *nil.*

To obviate this I have devised different electrodes which insure a continuous supply of whatever fluid may be used. In the *Lancet* of March 24, 1917, I have described an electrode for ionization of the prostate in enlargement which fulfils the requirement of a continuous fluid supply, and in the *British Medical Journal* of September 29, 1917, I contributed an article on the subject of this paper describing my methods of application.

My electrode for treatment of middle-ear and labyrinthine trouble is the external auditory meatus, filled with the fluid in use, and an insulated probe bared only at its extremity carrying the requisite current. This gives a full supply of the drug from which it is desired to draw the ions. The other pole, a hand electrode, I put in the hand, which, as a very small milliamperage is required (not more than 4 milliamps), provides a certain resistance and is convenient. The patient's head is laid on the table with ear uppermost. In middle-ear otitis where there is inflammation, thickening of the membrane, or possible semi-fixation of the ossicula, the absorbifacient action of iodine reduces the inflammation and exudation, tends to release the joints, and gives relief where there is pain. The fluid I use in these cases is a three-per-cent solution of iodide of zinc,[1] which is a stable and non-injurious compound and gives no pain. According to the duration of the case, acute or chronic, is the length of administration, which must be worked out in each case from the result. I pass the current for from five to ten minutes. An acute case of recent standing may only require, say, a week's daily treating; a chronic case perhaps two or three months, twice or three times a week, but though this is a tedious job, the patient whose case has been abandoned as hopeless will endure much for the restoration of lost hearing, and it is wonderful what can be done by this method where everything else has failed.

Of course perseverance is required both by patient and doctor, and the treatment should not be given up hurriedly, for it often happens that, after days or weeks of apparently fruitless work, it will suddenly yield to the prolonged usage. In acute mastoid inflammation I put the indifferent electrode (a well-wetted pad) behind the mastoid bone, and a much longer sitting is required, twenty to thirty minutes. Many a mastoid operation may be obviated if the case is taken in reasonable time in this way, and the relief given is great. In syphilitic disease of the ear I employ the biniodide of mercury (3 per cent), and I have seen benefit from the exhibition of iodide of arsenic in tubercular ear trouble.

I use an Eustachian catheter closed at the end but perforated with fine holes on the concave side, and supplied by fine rubber tubing with a fine wire running right through it to carry the current; the fluid (in this case potassii iodidi, as the zinc might cause sickness) is drawn from the inverted tube of a glass syringe This is useful in Eustachian catarrh, and adenoids and enlarged tonsils yield to its application, thereby often obviating excision. Children being "kittle cattle to shoon," this is only

[1]The strength of this solution was given in my article in the *B. M. J.* as "30 per cent;" just ten times too strong. This was due to the typist's error, and my carelessness in overlooking the error before sending it on, and has been a source of anxiety to me, as a 30-per-cent solution would be likely to cause pain and injury; 3 per cent is the strongest that should be used for the ear.

available where they are amenable, but parents so often dread operations that they take a lot of trouble to manage the little ones for you.

Hypertrophy of the turbinates yields most satisfactorily to ionization with the zinc iodide, taking the precaution that not too much is allowed to trickle into the pharynx; it can be expectorated. A fortnight or three weeks is about the average time required, of alternate days of five-minute application to each nostril. Twenty milliamps is required—more, if not too painful; but anything over thirty is apt to cause the electrode to adhere to the membrane by coagulation of the serum, and make a raw spot.

Nasal asthma is relieved by the zinc iodide (6 per cent), as is any nasal catarrh, thereby superseding cauterization and the raw surface left by it. A five-minute application to each nostril in these cases two or three times a week is sufficient, with a ten-milliamp strength.

Pharyngeal inflammation often yields quickly to ionization with potassium iodide. The best way to use this is by swabs on probes in terminal holders, insulated to the end, which is bared, and dipped frequently in the solution. In obstinate phlegmonous inflammation this is very efficacious with a ten-per-cent solution and five-minute applications.

Though, of course, no treatment is infallible, and many failures may be met with, I do not hesitate to affirm that, given a fair selection of suitable cases for the treatment, ionization supplies often an invaluable method in many difficult and obscure ear, throat, and nose cases that cannot be as efficiently reached by other treatment.

In ear work especially I regard it as an inestimable boon properly and judiciously applied.

"THRESHER'S FEVER."*

BY ARTHUR B. LIGHT, M.D.

The recent work done on occupational diseases (especially the dust inhalation diseases) by the men on the Medical Staff of the University of Pennsylvania Medical School was the incentive for the investigation of so-called "thresher's fever." The effects on the various tissues of the body produced by dust inhaled for long periods of time are well known, as is also their close relation to long-standing chronic infection. It seems quite interesting that the symptoms of "thresher's fever," where apparently too much dust is inhaled at one time, should resemble those of a beginning acute infection. It was the knowledge of this peculiar occupational disease that led the writer to the belief that perhaps there are acute dust inhalation diseases as well as chronic. A discussion of the exact etiology of the train of symptoms produced in some people while threshing wheat or oats will be taken up later. Suffice it to say here that it was the belief that there are acute dust inhalation diseases which led to the investigation of the disease. The object of this paper is to state the symptoms of the disease known as "thresher's fever" as experienced by the writer himself, and to call attention to other similar phenomena, with a slight discussion on the etiology.

The name "thresher's fever" is given by farmers to a train of symptoms which make their appearance directly after or during a day of threshing either of wheat or oats, and said to be worse after oats than after wheat. The attacks are especially severe when the grain is moldy. Some farmers become so ill as to absent themselves from all forms of threshing. Some get mild attacks whenever they engage in this occupation. Some get an initial attack for the year and are then immune. Others are susceptible only when the dust is especially dense. This variableness in the susceptibility of different persons is to be borne in mind when the queston of etiology arises.

*Read before the Undergraduate Medical Association of the University of Pennsylvania Medical School.

The disease is known wherever wheat and oats are threshed in barns where dust can accumulate.

When this paper was first written the writer had looked up the literature on dust inhalation diseases and could find no reference anywhere to this particular form of it. Fortunately, his attention was called to an article by Bowen,[1] who under the subject of dust fever briefly described the symptoms of "thresher's fever" as occurring in New York State. The other apparent acute dust inhalation phenomena will be mentioned later and their similarity to "thresher's fever" discussed.

In order to more thoroughly investigate and describe the symptoms, the writer, knowing that he was susceptible to attacks from previous years, subjected himself to a day's threshing and was promptly rewarded with an acute attack. He hopes the reader will pardon a personal recitation of the same.

I started work on a Monday morning in October, 1917, feeling perfectly well. We were first engaged in threshing wheat, and my duty was to fork the sheaves to the man who fed them to the machine. The place I was in was not as dusty as some others in the barn, but dusty enough to start with. My work was not especially hard, but my not being used to manual labor may have had something to do with the fact that my symptoms lasted longer than usual. I felt fine until 11 o'clock in the morning, when I noticed a very slight frontal headache developing and a feeling of oppression in the chest together with pain on deep breathing. This resulted in my taking shorter breaths at shorter intervals, thus running up my respiratory rate. Fatigue also began to set in, and I noticed a few blisters on my hands. My headache grew gradually worse, as did the feeling in my chest of oppression and pain on deep inspiration. Lunch was quite welcome at 12 o'clock, not because of hunger, but because I was becoming tired and my muscles were heavy. I ate very little. Work was resumed at 12.30, and on walking to the barn from the farmhouse I noticed that my limbs besides being heavy pained me somewhat when I moved them. We now started threshing oats, and soon I began to feel quite weak, with pains in all my limbs as well as my back, much resembling those of an acute attack of a heavy cold.

At 2 o'clock I had a distinct chill, and taking my temperature I found it to be 102°. The chill lasted several minutes. After a short rest during this period I was given the place of directing the "blower," a long tube about two feet in diameter through which the straw is blown either into the barn or on a straw-stack. This required very little labor, but was quite dusty. During all this time my headache steadily increased, as did the oppression and pain in the chest and the pains in my limbs and back, so that at 4 o'clock I decided I had had enough. My temperature was still 102°.

On my way home, which was a half-mile away, I was taken with another five-minute chill, which, together with my extreme shortness of breath due to pain, made me pause along the roadside to rest until it was over. I reached home completely exhausted and with a terrible headache. My appetite was completely gone. I was too sick and tired to take a bath, so I changed my clothes directly and took the first train for Philadelphia, arriving there at 7.30 that same evening, namely, Monday. On the train my temperature was 102.3°, pulse 120, and respirations 45. My head ached most severely, especially in the frontal regions. On walking several steps it would become throbbing in character, my shortness of breath decidedly increased, and the pain and feeling of oppression in my chest became almost unendurable. I ached throughout my whole body.

I was admitted to the students' ward of the University Hospital that same night at 8 P.M. with a temperature of 103°, pulse 100, respirations 45. A blood count at once gave R. B. C. 4,900,000, W. B. C. 19,000, Hb. 90 per cent. A differential cell count gave 90 per cent polymorphonuclear leuco-

[1] Bowen: *New York State Journal of Medicine*, 1912, July, xii.

cytes with no eosinophilia. During all this time I did not sneeze once or cough. There was slight if any mucous discharge from the nose. I spent a very restless night, refusing all drugs lest they should alter the course of my symptoms. The next morning, which was Tuesday, the urine was negative. A thorough physical examination this same morning gave the following findings: Slight injection of conjunctiva, flushed cheeks, slightly coated tongue, and rapid respirations. The lungs were negative to percussion. The breath sounds were emphysematous in type. No râles were heard. The lungs were said to be in a state of acute emphysema. My temperature fell during the day to 100°.

My symptoms all persisted except the chills, but their place was well filled by a cough which made its appearance on the slightest exertion, or on suddenly breathing deeply. It was very much like whooping-cough, coming in paroxysms and ending in an attempt to vomit. The cough, however, was unproductive. After a good sleep on Tuesday night my headache left me, but I was still weak, with pains in my chest on deep breathing and paroxysms of cough brought on by the latter. Appetite was still wanting and the shortness of breath persisted.

My temperature stayed around 100° during Wednesday and Thursday, while the pulse-rate fell to 90, but the respirations remained above 40. The pains gradually left my limbs and chest, but the shortness of breath still persisted, showing that something else was operating now in making my respirations short and hurried. The paroxysmal cough was even worse and became productive of a heavy, thick, mucoid material, black with dust.

On Friday morning the temperature, pulse, and respiratory rates were all normal. I felt like eating for the first time. On the slightest amount of exertion, however, the shortness of breath and troublesome cough would promptly reappear. The white blood-cell count was 8000. Gradually my strength came back and the dyspnea and cough disappeared. In a week my lungs were again normal, and I felt just as well as when I went down the country road to get my attack of "thresher's fever."

In comparing the above symptoms with those of twenty-five farmers, it was found that they were practically the same, except that the farmers were, as a rule, only sick from one to two days. This may have been due to the fact that they were used to manual labor. Chills were the thing they hated most. A case of stupor in a boy of nineteen was reported in which the doctor did not make the diagnosis until he knew that the lad had been threshing. The boy was found along a country road one evening, having been taken ill on his way home from work.

The treatment as practiced by the farmer —for as a rule he prescribes for himself— is altogether symptomatic. It consists, chiefly, in combating the chills. As a rule he sits alongside of a hot stove with his feet in a bucket of hot water. He then takes a drink of whisky and hot lemonade, which combination is supposed to drive away the chills and produce sleep. The farmers claim to be well again in the next day or two, but on questioning their wives it seems they do not do very much work for several days, and are content to rest as much as possible.

On looking up the literature of acute symptoms following dusty occupations the following groupings were found:

"Mill Fever."[1]—This is the name given to a train of symptoms that is sometimes found in people who for the first time take service in linen works. The symptoms are nausea, vomiting, headache, and rise of temperature. They usually last several days. The writer who reported it said it was probably due to the stifling and moist atmosphere.

"Shoddy Fever."[2]—This syndrome comes nearer to the symptoms encountered in "thresher's fever" than any of the other similar apparently acute dust inhalation diseases. Persons engaged in the separation of woolen from linen and cotton rags, as

[1]Oliver, Sir Thomas: Dangerous Occupations.
[2]Oliver, Sir Thomas: Dangerous Occupations.

well as in grinding up the woolen rags, are often taken with chills and fever. The symptoms are rise in temperature, severe headache, signs of bronchitis, nasal catarrh, and muscular pains. Dr. Stuart, the medical officer of Bath, Yorkshire, England, who reported the disease, says it cannot be distinguished from the beginning of an acute attack of influenza. It declines rapidly in from two to three days but may recur at any time.

Workers in certain types of box-wood and in shuttle-making in England are taken with symptoms of a bad cold in the head, sneezing, running of the nose, and sense of oppression in the chest. Only people beginning work at this occupation are attacked. The symptoms last only a few days. Wounds made from splinters of this wood do not tend to heal very readily and often suppurate.

Persons beginning work in jute mills for the first time often suffer with headache, vertigo, and extreme tiredness, accompanied by a rise of temperature. The attack usually lasts about three days.

Workers in brass factories are said to be taken with chills which last varying lengths of time.

An epidemic of cough, extreme sense of oppression, muscular pains, and rise of temperature, among weavers in cotton cloth in England, was reported by Collis[3] in 1914. The attack as a rule lasted several days. There was good evidence to show that a mold, the *Penicillum Glaucum,* may have had something to do with these attacks.

As to just what is in the dust and how it operates in producing the symptoms of "thresher's fever" and the related organic dust inhalation diseases are not known. The writer has asked the opinion of various authorities in bacteriology, immunity, medicine, etc., as concerning their proper grouping. The following have been set forth with arguments in favor of each one: anaphylaxis, infection, parasites, molds, and local irritation with some absorption.

Anaphylaxis means the peculiar reactions the body has to foreign proteins, being variable in character and manifesting themselves in different organs and in various ways. Naturally when one thinks of disturbed physiology in relation to wheat and oats, the mind is at once led to believe the phenomena due to anaphylaxis. Even though there is still a good deal to be learned about anaphylaxis, certain well-recognized tests are made use of in determining its presence. Persons who react to a foreign protein will always react to it unless strenuously treated. This explanation will then not cover such cases in people who are sometimes attacked and at other times are immune. The skin tests for protein sensitization were performed on the writer, using the protein of wheat, corn, and oats, both by the cutaneous and intracutaneous methods. The only one to give even a slight reaction was the cutaneous corn test. Eosinophilia is usually present in the blood and sputum, but in neither place were they found. The white cells numbered 19,000 during the acute attack; in protein reactions, leukopenia is the rule. The physical findings in the lungs, however, suggested very strongly the presence of a reaction to a foreign protein. They were said to have been in a state of acute emphysema, similar to that which occurs in the lungs of a guinea-pig from anaphylactic shock.

The symptoms when studied certainly are like those of an acute infection. The fever, chills, pains throughout the body, leucocytosis, all point this way. The period of incubation is almost too short and the symptoms seem to progress in proportion to the length of exposure. Acute infection does also not explain the variable susceptibility of the same and different persons.

Molds and parasites must be borne in mind. Thorough examination of the sputum and exudate from the lungs and trachea revealed no parasites. In the epidemic of cough, etc., reported by Collis, the presence of mold was regarded as the etiologic factor. The farmers have always maintained that the attacks are worse when the grain is very moldy. The molds may

[3]Collis: Proc. Royal Society of Medicine, Section of Epidemiology and State Medicine, April, 1914 page 108.

act by forming some type of gas, just as the *Penicillum Brevicale* forms di-methyl-arsine, when growing on wall-paper prepared with some arsenical preparation. But such a gas should always be present in a barn where grain is stored, and susceptible persons working near-by should be attacked. This is not known to occur. On the other hand, the spores themselves may be inhaled and cause trouble by lodging in the different respiratory passages.

Under the theory of local irritation and some absorption, it is believed that numerous organic particles are inhaled into the nose, accessory air-spaces, trachea, and lungs, and that these particles produce enough local irritation, and after absorption and disintegration enough change, in the chemistry of the blood to cause the various symptoms. The frontal headache was especially suggestive of irritation in the frontal sinuses. The pain in the chest as well as a feeling of oppression was due to local irritation with reflex bronchospasm. The leucocytosis was an evidence of phagocytotic activity in getting rid of the foreign particles.

There is difficulty here in explaining the varying susceptibility of the same and different persons. This might be due to the fact that people who escape the attacks can breathe in such a manner as to draw very little of the dust into their more sensitive mucous membranes. Others who are attacked are unable to breathe thus, and consequently inhale too much.

To explain the fever and chills, it is assumed that some of these organic particles are absorbed into the blood-stream and by their disintegration cause these symptoms.

The most interesting feature of "thresher's fever" is then its etiology, and the possible light it may throw on the relation between infection and the inhalation of dust, and the effects on the tissues of the body. The writer believes that there are certain types of organic dust such as are found in grain which, if inhaled in sufficient quantity, will set up local inflammatory signs similar to those incident to infectious organisms. Different quantities of this dust may get into the blood stream as do bacteria or their toxins, and in their disintegration cause constitutional symptoms. In the case of organic dust the body must contend only against the particles and their disintegrating products. With bacteria, it must overcome not only their minute bodies and their products of disintegration but also the products of their vital activity.

The pathological picture of a lung, the subject of long-standing irritation from dust, is one of fibrosis. Chronic infection often does the same thing. Assuming, then, that the various acute attacks mentioned are due to the inhalation of too much organic dust, one can see how too much of this dust at one time acts very much like the acute infections, just as less amounts or less irritant dusts over long periods of time produce body changes similar to those produced by chronic infection.

THE CLINICAL VALUE OF RADIUM.

The *Lancet* of March 23, 1918, tells us that the latest evidence that has been brought forward of the value of radium is contained in the report of the Radium Institute just issued. In this document the director, Captain Hayward Pinch, recounts what the Institute has done over many years of working, tabulates the results that have been obtained, and tells us what he considers radium can do. This report differs in character from those published in previous years in so far as special prominence is accorded to the after-history of cases examined and treated at the Institute between August, 1911, and December, 1914. But the statistical tables concern only the new cases seen at the Institute during the year 1917. Of all the forms of malignant disease the least obviously malignant is rodent ulcer, a condition well defined by its pathological histology, but not rarely confused in some countries with ordinary squamous-celled carcinoma of the skin. Rodent ulcer is amenable to many methods of treatment: the *x*-rays, carbonic acid snow, ionization, and excision can all re-

move it, though with every one of them the risk of a recurrence remains great. Indeed, there would be little or no need to invoke the aid of radium for the treatment of a disease so amenable in ordinary circumstances, but that the disease has this great tendency to recurrence; therefore, if we can find a method of treatment which materially lessens the chance of recurrence it should be used.

Now the evidence produced by Captain Pinch is in accordance with the opinions formed by all who have had experience of the use of radium in cases of rodent ulcer—viz., that the disease can be removed by radium with certainty, and that if a sufficient dose be administered recurrence does not take place. The value of radium for rodent ulcer is thoroughly established by the results obtained at the Radium Institute. With the more malignant forms of cancer the results of the use of radium are not so certain; improvement is common, but a cure is rare. Whether affecting the skin or a mucous membrane, epithelioma has shown a noticeable improvement in almost every case under treatment in the Institute; in many the local lesion disappeared, and no recurrence occurred for many months or even for years; but in others, although the local lesion was apparently cured, the disease manifested itself in the neighboring lymphatic glands. Even when the disease is not entirely removed some of the complications may show very distinct benefit from the action of radium. When after carcinoma of the breast there is evidence of lymphatic obstruction in the arms, the swelling of the arm and hand is often considerably relieved by radium, if the treatment is employed before the engorgement has lasted long.

Among the other conditions which have shown improvement after exposure to radium when administered at the Institute may be mentioned lymphadenoma. Many cases of sarcoma show themselves remarkably amenable to the treatment, but other conditions, such as those of lupus erythematosus, only occasionally exhibit slight improvement. The use of radium in the treatment of scars is set out very convincingly in the *Lancet* of March 27, 1918, by Captain W. C. Stevenson, whose experiences coincide with those of the Institute in regard to keloid. The whole record of the work under the superintendence of Captain Hayward Pinch goes to show that with intelligent application we have in radium a valuable therapeutic agent, while much of the results suggests that further experience in its employment will expand its utility.

One important question remains to be considered, How does radium act? There have been many suggestions as to its mode of action, but only one fact seems to have been really ascertained. The action seems essentially to be the same as the action of *x*-rays. Both these forms of radiant energy appear to have a destructive influence on all forms of living tissue, but this influence is decidedly greater and more readily manifested on abnormal cells than on the healthy tissues of the body. The cells become granular and break up; sometimes vacuoles appear in them; absorption of the débris occurs, and for a time a shrunken cell membrane is all that remains of the erstwhile malignant cells; then appears new fibrous tissue, the amount varying widely in different cases, and thus, if success is following the treatment, the malignant mass is replaced by a fibrous nodule, while in some cases no trace may be left of the former disease. The deeper the disease, the greater the obstruction offered to the rays, and the less the effect of the treatment. An increase in the amount of radium employed will to a certain extent compensate for the increase in depth, but there is a limit to this; so that it is not possible to follow malignant disease which has penetrated far into the tissues, or to deal with secondary growths. A further difficulty is to be found in the fact that the rays of radium, though affecting normal tissues to a much less extent than morbid tissues, do affect them, and thus once again we find a hindrance to the unlimited increase in the power of the radium employed. Time may show how these difficulties may be overcome, but with all its limitations the use of radium has afforded us substantial aid in the treatment of some very difficult pathological conditions.

EDITORIAL.

THE KIDNEYS, THE BLOOD, AND THE DIET.

The advances which have been made in physiological chemistry during the last few years have rendered the greatest advantages to the clinician who is so placed as to have competent laboratory facilities at hand. Many months ago, in one of our leading articles, we discussed the importance of estimating the non-protein nitrogen of the blood when considering the prognosis, diagnosis, and treatment of chronic renal disease, and since that time we have frequently printed in our Progress columns items which dealt in detail with this important subject.

Unfortunately the advances which have been made along the lines of diagnosis and prognosis are greater than those which have been made along the line of therapy, which is unusual in the history of medicine, since, as a rule, the clinician devises efficient methods of treatment first, and the explanation of how they successfully act follows investigation by the laboratory worker.

The statement made by Cushny that "in no other organ of the body has there been such poor work as the kidney, and in no other region of the body was so much bad coin passed as legal tender" is certainly true. It therefore behooves us to study carefully all accurate investigations which are made along these lines. The old uric acid theory as a factor in disease has been cast aside, not only as crude but incorrect, and modern investigation has revealed the fact that red meats are no more harmful than white meats. So, too, it is becoming increasingly evident that it is not necessary to deprive all nephritic patients of their protein food, and, further, that such deprivation, in many cases, is unwise since the disturbed nutritional balance robs the patient of foodstuffs which he greatly needs.

As we have pointed out on previous occasions, it would appear that the normal non-protein nitrogen content of the blood is between twenty-two and thirty milligrams per cent—that is, this number of milligrams to 100 Cc. of blood. This non-protein nitrogen consists in about fifty per cent urea; the remaining fifty per cent consists of creatinin, uric acid, and substances belonging to the group of amino acids. In disease, however, the increase in the non-protein nitrogen consists chiefly in an increase in the urea, and, secondly, in the uric acid content. It is only when the condition becomes still more grave that the creatinin content begins to mount. While it may be true that thirty milligrammes per cent is a maximum normal, it is also true that a considerable number of patients seem in perfect health when the percentage is slightly higher than this. The higher it is, however, the greater the gravity of the case, and it is claimed by those who have had the largest experience that in those instances where it exceeds sixty millimeters per cent death usually takes place within a few weeks, but we have under observation at this time a patient who four weeks since showed 170 milligrams per cent! In other words, it behooves the physician in charge of such a patient to at once institute the most radical measures for his relief by instituting absolute rest, carefully regulating the diet, and using hot packs or electric cabinet baths. These rules would seem to hold true not only in regard to the different types of chronic nephritis, but in acute nephritis as well, save that in acute nephritis the general tendency is often for recovery and cure, whereas in so-called chronic nephritis, which is really a degenerative process, ultimate recovery is out of the question.

As the estimation of non-protein nitrogen cannot be made by the general practitioner, unless he has special laboratory training and facilities, the question arises as to whether there are any collateral avenues of investigation which, having been found to go side by side with an increase in the non-

protein nitrogen, can be used to indicate that this blood condition exists. Many of the profession have had the idea that a high blood content of uric acid was necessarily associated with high blood-pressure, but this view has little to support it, and, indeed, it would appear that it is wise to consider it definitely erroneous in the sense of cause and effect.

We note with interest that Cummings, in the study of eighty-two cases, found that there was no association whatever between blood-pressure and the amount of non-protein nitrogen. Thus, he cites one patient, whose blood showed only fourteen milligrammes per cent, who, nevertheless, had a systolic blood-pressure of two hundred and thirteen, diastolic one hundred and forty-five; whereas another patient with seventy-three milligrammes per cent had a blood-pressure of one hundred and eighty systolic, one hundred and twenty diastolic.

The next question is as to whether testing the kidney function with the phenol-sulphonephthalein test will give us reliable information in regard to the non-protein nitrogen content of the blood. Here, again, we may turn to Cummings's observations with interest and profit, the more so as they agree with those which have been obtained by other investigators. It would appear that this test has some significance as to the blood content, although it cannot be denied that, as a general rule, as the phthalein excretion goes down the non-protein nitrogen content is found to be increased. This is especially notable when the phthalein excretion is as low as fifteen per cent, when the non-protein nitrogen is almost sure to be high. Of course, this makes it clear that the phthalein test is indicative of a high non-protein nitrogen content chiefly because in those cases in which the elimination of the dye is so impaired grave kidney disease is clearly apparent.

So far as prognosis is concerned, we have already said that a high non-protein nitrogen content, in the neighborhood of 60 mg. per cent, is of very grave omen. If, under treatment, it rapidly drops, the physician may be encouraged; but if a notable drop does not occur within a few days, death will almost certainly shortly occur.

Cummings brings forward the interesting question as to how high the non-protein nitrogen may go and yet recovery take place, meaning by recovery not cure of the kidney lesion, but recovery from the emergency which confronts the patient and the physician. He records one case with one hundred and ten milligrammes per cent, which under treatment dropped to forty milligrammes and remained fairly well for several months, when, breaking away from treatment, he relapsed and died.

An important point to be considered in this connection, which point is difficult to determine except from the history of the patient, is how much of the kidney is permanently diseased and how much is temporarily put out of function by acute congestion or inflammation superimposed upon degenerative change. It frequently happens that a chronic nephritic, who is doing fairly well, is precipitated into an attack of uremia by some cause which interferes with the functional activity of the remaining healthy or semihealthy portions of the kidneys. If the patient can be kept going long enough for these parts to recover their efficiency and to eliminate poisonous materials the outcome may be favorable, whereas if the uremic catastrophe represents complete and utter breaking down through advanced degenerative processes, the efforts of the physician must fail both in reducing the non-protein nitrogen and in bringing about improvement in the general state of the patient.

Perhaps the most important part of Cummings's contribution to this subject, which appeared in *Northwest Medicine* for February, 1918, is his conclusion that the estimation of non-protein nitrogen is a guide as to the use of water and the employment of protein foodstuffs. He thinks that when the non-protein nitrogen is abnormally high it is imperative to cut the nitrogen intake as low as possible until the non-protein nitrogen content of the blood approximates normal. On the other hand, he uses these words, which are important to remember: "It is

unnecessary to give an extremely low protein diet in all cases of nephritis. In many it is positively injurious, for it increases the anemia which is so frequently marked in this condition."

RADIUM AND HODGKIN'S DISEASE.

It long since became apparent that in the discovery of radium as a therapeutic agent we failed to discover what was hoped, namely, that it would exercise a curative influence in those cases for which, up to date, we have had no remedies which can be considered as curative. It is quite true that superficial epitheliomata yield with remarkably good results to its proper application. Its employment over the area of operation, in cases in which the breast has been removed for carcinoma, seems to distinctly diminish the chances of recurrence. In cases which are by no means definite in their nature we now and then have reports in which radium has apparently worked wonders. Possibly we are expecting too much of radium when we ask that it will cure malignant growths of internal organs, when they have been so long present that metastasis to other parts of the body has occurred; nevertheless, we cannot help feeling that, just as salvarsan is a disappointment in many cases of syphilis, failing to be the universal cure that it was hoped, so, too, radium has but a limited sphere of value, which up to date seems to be narrowing rather than increasing in its scope. That radium is a very valuable remedy in malignant disease, however, cannot be denied. Aside from the knife, it is without doubt our most potent agent, and while it cannot supplant the knife, it may do good in cases in which the use of the knife is impossible or inadvisable.

Recently Simmons and Benet have reported in the *Boston Medical and Surgical Journal* the results which they have obtained in the treatment of Hodgkin's disease with radium. Hodgkin's disease, of course, is widely separated from carcinoma, and also is widely separated from sarcoma, so far as its histological characteristics are concerned, but from the standpoint of its mortal effects it belongs in the same class with these malignant growths, since when it occurs it has been the universal experience that it is fatal within a comparatively short space of time. Unfortunately, this fatality still holds true even when radium is called into action with the hope that it may moderate, or actually cure, the disease. Thus, Simmons and Benet having used radium in nineteen cases, proved by microscopic examination to be true cases of Hodgkin's disease, conclude that the use of either radium or the *x*-ray is followed by a marked temporary amelioration of symptoms, by diminution in the size of the glands, and by improvement in the general condition, but they add the significant words: it must be admitted that in the majority of cases it has not prevented the progress of the disease to a fatal termination. They point out, however, an interesting difference between the action of radium upon the tissues in Hodgkin's disease and upon the tissues involved in carcinomatous growth. In Hodgkin's disease the reduction in the size of the glands takes place without burning or necrosis, and there is a definite relationship between the treatment and the effect on the glands, whereas in carcinoma necrosis is to be expected.

In the endeavor to find some explanation of the failure of radium in Hodgkin's disease, Simmons and Benet expressed the belief that such a failure is, in part, due to the fact that the treatments, in almost every instance, were necessarily confined to the mass of glands in the neck, axilla, or groin, only a few patients receiving the treatment over the spleen, abdomen, and sternum, and these treatments were probably of insufficient strength to have reached the deeply-situated lymph nodes. They also think that just as soon as the presence of Hodgkin's disease is suspected there should be systematic treatment of all the glandular regions of the body where there is the slightest evidence of enlargement of the glands, since by this means early changes can be arrested before the disease has advanced so that it is easily distinguished. It appeals

to one's reason to believe that it is useless to apply treatment to the glands of the neck and ignore those in the mediastinum.

The actual results obtained by Simmons and Benet are summarized as follows: Of the nineteen cases, proved beyond all doubt to be Hodgkin's disease, fourteen are dead and five are under treatment, and it is possible that these five represent the chronic form of the malady. Two of the cases that are living have been under treatment eighteen and twenty-seven months respectively and are in poor condition. Two others have been under treatment for twenty-two and thirty-six months respectively and are said to be in good condition, having only a few small shot-like glands. The fifth case is in fair condition, but has had little treatment.

The method which they have employed has been in the form of emanation, which is collected and sealed in a capillary tube, which, in turn, is enclosed in a small metal jacket, each tube representing from ten to two hundred and fifty millicuries of emanation, the strength naturally varying with the age of the tube. Such a tube is applied to the patient over two millimeters of lead and two or three centimeters of gauze screen, and kept in position from one to twelve hours. In a few cases they inserted the tube directly into the mass of glands when the glands were superficial. Where the glands were deeply situated, as in the mediastinum, or elsewhere, the tubes were placed two to four centimeters above the skin in order to obtain a maximum dose with minimum danger of burning the skin. When a skin reaction developed it usually appeared in from one to three weeks.

The application of radium not only produces local changes but systemic changes, presumably the result of the changes in the glands. These constitutional disturbances consist in nausea, vomiting, prostration, and fever. It is worthy of note that these symptoms not only occur soon after exposure, but occur whether radium or the *x*-ray is employed. The impression which Simmons and Benet have obtained from the use of the *x*-ray in Hodgkin's disease is that while the glands diminish in size, the improvement is not as marked as with radium. Improvement is usually seen in from one to three weeks after the first application.

Finally, in all of these cases it is to be recalled that a clinical differentiation between tuberculous lymph nodes, lymphosarcoma, and Hodgkin's disease is practically impossible without a microscopical study of the growth.

TRANSFUSION.

The transference of blood from an animal to a man and from man to man may be considered almost an ancient practice. In comparatively modern days Mr. Pepys describes in his diary having witnessed such a transfusion which, apparently, was not followed by anything else except good results to the patient even if Pepys's conduct afterwards was not beyond reproach. Nevertheless, the employment of pure blood, or of defibrinated blood, because of lack of asepsis or because the foreign blood agglutinated the blood corpuscles of the recipient, thereby producing disastrous effects, became so unpopular that it was rarely resorted to, the more so as it was recognized that by such transfusion certain diseases, notably syphilis, would be transmitted. When the ability to reach a positive diagnosis of syphilis depended entirely upon the truthfulness of the patient, or the manifestation of clinical signs, this danger was so real that this objection to transfusion was infinitely more powerful than it is to-day.

Recent reports from the European battle-fields would seem to indicate that the danger of agglutination is more remote than has been generally thought, and, therefore, some battle-field surgeons have gone so far as to minimize it and even ignore it. This may be justifiable where an enormous number of men are to be treated and when one or two fatalities due to incompatibility between the blood of the donor and donee are of minor consequence as compared to the large number of lives which may be

saved, but in civil practice we think it may be said very positively that transfusion should not be attempted, except in the presence of the most urgent need, without an agglutination test being first performed.

At no time has medical literature contained more contributions upon this subject than at present. Transfusions are being resorted to not only to combat the results of acute hemorrhage but those of chronic hemorrhage, in pernicious anemia, and in the hemorrhagic diathesis. Some advocate the direct transfusion from artery to vein by means of glass tubes coated with paraffin, of which tubes probably the best are those devised by Fauntleroy of the U. S. Navy. Others claim excellent results by withdrawing the blood from the donor by means of large syringes, the barrels of which are coated with liquid paraffin, and then directly injecting the blood into the vein of the donee. Others, fearing the formation of clots, which will result in emboli, receive the blood into a citrate of soda solution, whereby coagulation is prevented, and those who practice this method claim that the amount of citrate of soda which is necessary to prevent coagulation of the donor's blood is so small as to be without effect upon the blood of the recipient, although others have contradicted this statement.

Practically no one at the present time advocates the injection of blood serum as a substitute for blood. If they do not employ straight blood, or citrate blood, they fall back upon normal saline solution.

No one who has attempted any of the methods of transfusion has done so without learning that the process is more difficult than it appears in type, because the veins of the recipient are usually so collapsed, or so small, and are often so embedded in fat, that it is difficult to enter them without doing damage to both walls of the vessel. To meet this difficulty in children a number of clinicians, in different portions of the world, strongly advocate for infants the injection being given into the longitudinal sinus, in the middle line, at the posterior portion of the fontanelle. It has been shown that this method, if performed under ordinary aseptic precautions, is devoid of danger, and exposes the child to less trauma than an attempt to enter a vein in the arm, or, as some have advocated, the jugular vein.

Dunn and Howell of Boston, and Tarr of Portland, Oregon, and a large number of others, have advocated this method. Indeed, they have gone one step further and introduced dextrose solution in cases of profound emaciation, complicating the choleraic diarrhea of infancy, with good results, seemingly saving life in otherwise hopeless cases.

For this purpose the best method seems to be to use a 20-Cc. glass syringe attached to a piece of rubber tubing, which contains as a segment a piece of glass tubing, so that the fluid can be watched as it passes from the syringe to the needle. That the method is largely devoid of danger and comparatively easy is shown by the statement of Tarr that he has entered the sinus five hundred and seven times for blood to be used in the Wassermann test, or otherwise, and that he has administered dextrose to ninety-four infants, under two years of age, one or more times. He has also given salvarsanized solution by this avenue of entrance to fourteen infants under two years of age, and treated thirty-one cases of acidosis in infants, under two years of age, with alkaline solution with twenty-six recoveries. Indeed, in one instance in which the covering of the fontanelle was cartilaginous, a gold-plated lumbar puncture needle was used to perforate it. When blood is to be withdrawn for the Wassermann test, he believes that an ordinary 5-Cc. Luer syringe and a short needle are all that is necessary. Tarr's experience has been so favorable that he strongly advocates it in the hemorrhagic diseases of the new-born, in primary hemorrhage, posthemorrhagic anemia, and in the treatment of marasmic infants suffering from acute sepsis or anemia of one of the infectious diseases. He has used not only pure blood so injected in infants, using the 20-Cc. Luer syringe, but citrated blood as well.

THE TREATMENT OF PERIPHERAL NERVE INJURIES.

The Surgeon-General's Office is issuing each month a Review of War Surgery and Medicine in which are to be found short abstracted articles from current periodicals, or even of more value careful study and correlation of the newer knowledge gained by experience of traumata with the therapeutic indications derived therefrom. In a recent issue there is found such a study on the treatment of peripheral nerve injuries based on Lyle's report to the Surgeon-General, who states that every wound or injury of the peripheral nerves should be recognized at the earliest possible time and the treatment should be instituted at once. He particularly emphasizes the statement that it is imperative whether the nerve is divided or not, that the paralyzed muscles be relaxed and protected from strain by suitable apparatus. In no circumstances must this be deferred as an after-treatment. Not only should no overstretching be permitted, but fixation of the tendon and joint should be prevented by early massage. This massage should not, of course, be applied to inflamed tissues, but should be instituted as soon as inflammation has subsided.

Operation is applicable to anatomical interruptions or to physiological operations when due to pressure or scar. In many cases distinction is made clear by observation and time. Except in cases definitely strangled with scar tissue, recovery may follow massage and other non-operative remedies. In anatomical interruptions he includes lesions of intraneural scar tissue as well as actual solution of continuity of nerve. A reaction of degeneration is common to both physiological and anatomical interruptions. However, this is usually partial and incomplete in the former conditions. Tinel states that muscular tone is also as a rule preserved. Tinel records that 60 per cent of nerve lesions recover spontaneously with proper postural, mechanical, and electrical treatment. He states that the indications for operation are as follows: Absence of regeneration; defective, difficult, or partial regeneration; complete interruption. Because a nerve fiber is incapable of excitation we cannot conclude that it is not in spontaneous regeneration. Electrical excitability is a late phenomenon. The sensibility of nerve to pressure, formication, and return of tone and paresthesia are important signs.

Tinel's syndromes are important to remember: Interruption, compression, irritation, and regeneration.

Cassirer found only 60 operative cases among 240 nerve injuries, and in only 15 was the nerve found severed.

Carrel, in connection with Carrel-Dakin treatment, advised immediate suture of nerves in fresh injuries, as nerves resist infection well, and excessive retraction of the nerves is by this procedure prevented, so that subsequent operation is easy. Moynihan operates in complete division of the nerve; in cases of incomplete divisions or arrested improvement; and in causalgia. He waits three months after healing in bone cases and one month in other cases. He urges the correction of joint ankylosis before operating on nerves: "Do not operate until healing is complete, else infection will flare up." As an additional argument for delay, it may be stated that cases treated with massage give their first signs of regeneration in from two to four months, and in one case in nine months.

There are two distinct types of operative procedure: Neurolysis, or freeing of nerves bound by extraneural scar tissue (the so-called simple compression of Tinel). Repair of complete anatomical division. The operation of neurolysis is a simple procedure consisting of freeing nerves from extraneous scar tissue. With operation in aseptic field, with proper control of hemorrhage, and with suitable after-treatments, the adhesions have the likelihood of not returning; or their return is benign. Liberation is ineffective in intraneural nerve scar, in "keloid," or in severe lesion of nerve sheath involving the nerve itself. Tinel states that in such cases either suture or non-interference is indicated.

Moynihan does not approve of any form

of material about the suture line. Complete anatomical division may be due to section and absolute separation of the ends of nerve, or it may be due to intraneural connective tissue, either combined with extraneural tissue or not combined. This condition calls for cutting through the nerve and reunion by suture. Following gunshot injuries the nerves may be found either continuous or divided, but completely fused in a great mass of general scar tissue. The scar may be extraneural, it may involve the sheath, it may appear as an intraneural diffuse or massed scar tissue. As much as 4 inches of this type of destruction may be present. If there is complete separation, usually a neuroma occurs on either segment. To allow access to such damaged areas very wide dissection must be practiced, start being made in normal regions to either side of damaged area. Intimate anatomical knowledge is necessary. In making these dissections the nerve should not be handled. Tissues are best retracted away from the nerve. When necessary to retract the nerve this should be done with tape.

When the nerve is freed examination is made to see how much is functional and how much is scar tissue. The condition of the nerve may be ascertained by incising the sheath and examining for fasciculi. These have an angleworm-like appearance. It is customary to make repeated transverse sections of the neuroma until the cross-section presents a normal appearance, both in the distal and proximal portions. The normal nerve presents fasciculi close together with good blood supply.

The blood supply of the nerves is important both from a question of viability and the question of hemostasis. Fifteen inches of the nerve can be stripped loose and yet retain enough circulation to give capillary oozing when cut.

All operators agree that the ends of the nerve, after being freed from scar tissue, had best be approximated. As to fascicular orientation—that is, the bringing together of a nerve without twisting or altering its anatomical relationship—this is usually regarded as being important, although there are some who differ from this view. The union of cut nerve seems to be fairly well advanced in four days. Therefore catgut can appropriately be used as a suture. Tension must be avoided and the slightest traction on the suture line renders coaptation impossible. When by flexing the limb it is impossible to secure coaptation of the ends of the nerve, fascial tubes seem to be the fashion, fat fascial grafts perhaps being the best material. As for nerve grafting axis cylinders will grow *in vitro* from nerve cells and have no independent power of growth. Autogenous grafts undergo Wallerian degeneration and serve as a scaffolding for new axis cylinders. Intercostal nerves are recommended for the use of free grafts. In case distance has to be regained from loss of nerve substance, this is usually overcome by flexing the limb, and it is so held and immobilized for six weeks and then gradually extended. The straightening of bent limbs may be done by plaster cast and wedges. Forcible tearing up of scar tissue in tendons or joints should be avoided. Elastic traction with a variety of splints is sometimes used. As for splinting and its application to individual nerves the deltoid paralysis incident to injury to the circumflex calls for the retention of the arm in a position of abduction at right angles to the body. Jones's abduction arm splint does well.

The median and ulnar nerves supply the flexor muscles of the forearm. When paralyzed the tendency will be toward hyperextension of the hand on the wrist and the fingers on the hand. To offset this a splint should be worn to maintain the hand and fingers in flexion. Moderate pronation should also be provided on account of the loss of the pronator teres.

The musculospiral nerve calls for splinting with the arm extended to relax the triceps and held in supination. The anterior crural nerve gives loss of power in the anterior muscles of the thigh and iliacus and pectineus which act as thigh flexors. Kicking power is absent and contraction of the flexors of the knee is to be expected. The leg should be held extended on the

thigh by means of a straight posterior splint of wood or plaster of Paris or by means of a Thomas knee splint.

The sciatic supplies the muscles of the back of the leg. Paralysis causes hyperextension of the knee, best guarded against by a Thomas splint. At the same time there is complete paralysis of the muscles moving the foot, and retention at right angles is necessary by means of a metal or plaster footpiece.

Injuries to the internal popliteal nerve call for a position of complete plantar flexion of the foot. Plaster of Paris is the most effective splinting material.

Paralysis of the external popliteal nerve supplying the dorsal flexors allows footdrop and eversion. Musculocutaneous nerve paralysis produces inversion through loss of the peroneal muscles and a position of the foot approximating clubfoot. Plaster is usually employed. The splints should be comfortable and should be worn constantly save when treatment is being given, and they should be worn at night for a prolonged period after recovery has been advanced, this extending into weeks or months. In old deformities non-operative correction is to be preferred. This calls for corrective pressure, and this implies pressure on the soft parts and requires constant vigilance, especially to assure as rapid correction as the skin resistance will permit. Severed nerve begins active efforts of repair immediately in a clean wound; as soon as infection is checked, in a septic wound. The nerve tendrils grow in loose granulation tissue and are very delicate and easily injured. Absolute rest and avoidance of massage are essential in the early stages, a splint well applied being worn continuously for two or three weeks. Hydrotherapy presents an early method of great value. This consists in hot baths, hot packs, contrast baths with variations from 50 to 120 degrees of temperature; the whirling and bubbling baths and hose baths under heavy pressure are valuable.

The action of electricity is upon the muscles alone and not the nerves. It maintains tone and aids nutrition by direct stimulation of muscle fiber. It also reduces contraction of the muscle in the early stages of reinnervation. Heat may be applied by means of hot baths or baking chambers. Massage is, however, the most generally useful method of any of these measures. Many inventions have sought to supersede the human hand as instruments of massage, but without success. Work should be done with the paralyzed muscle, which should be relaxed and the deformity overcorrected, therefore the patient's position while being massaged must be planned. Corrective exercises should follow the gentle forms of massage necessary in freshly wounded cases, and begun at once in cases in which deformity has already developed.

METHODS OF DEALING WITH HERNIA IN THE ARMY.

So many men otherwise able-bodied and of military age are afflicted with hernia, a condition which in early life is now regarded as safely and entirely remediable, that the question of selection and assignment to active surgery has arisen with the country at war and has been settled in various ways. It will be remembered that according to the last instructions of the Provost Marshal General all cases of hernia are placed in the deferred or remediable class and are subject to call on order of the War Department. In England men are inducted into the service, radically cured, and put on active duty. Canada first tried this plan, but was so cursed by complaints of those thus treated as to the effect of operation that these cases are now grouped in the deferred class, given trusses, and are assigned to home duty. In England, Hull, who is in charge of the Hernia Department, states that trusses are not a satisfactory solution of the matter so far as the soldier is concerned. His operative material is not large, about 500, and yet his technique is extremely simple, based as it is on the concept that hernia is, in men of military age, nearly always due to the presence of a congenital sac. Indeed, he states that much of

the trouble following the operation for radical cure of hernia and many of the recurrences are due to well-intentioned but ill-advised efforts of the surgeons to effect repair. His method consists in removing the sac at its highest possible level with a minimum disturbance of tissues, which is followed by an extremely rapid convalescence without reaction. He attacks the hernia from within the sac through an inch incision. He thus describes it:

The operation is performed under local anesthesia as a routine measure. An incision from half an inch to an inch in length is made over the needle puncture and carried down to the aponeurosis of the external oblique. The fibers of the external oblique are split for a distance of half an inch. The opening in the external oblique should lie directly over the spermatic cord. The cremasteric and spermatic fascial coverings of the cord are drawn through the aperture of the external oblique. The cremasteric fibers are separated and the spermatic fascia incised. The sac is then found lying inside these coverings. Two pairs of fine hemostatic forceps are placed upon the edge of the sac, and an incision half an inch in extent is made between them by a snip of a pair of scissors. The two layers of the sac forming the lips of the aperture are now clipped with hemostatic forceps. The aperture can now be held open by four pairs of forceps, and four incisions are made, one between each pair of forceps, enlarging the aperture sufficiently to display the interior. If omentum lies in the sac it is drawn out, ligatured, and cut off. The interior of the sac presents for examination two apertures, one the internal ring passing into the abdomen, the other passing down the inguinal canal. These apertures are separated from one another by a process of peritoneum, the "crista," and in a well-marked case the apertures resemble the muzzle of a double-barreled shotgun.

The process of peritoneum called the crista corresponds to the internal margin of the internal ring. Forceps are clipped on to the crista in one or two places. It is now necessary to separate the important tube leading down the inguinal canal. This is done by cutting along the crista to the mesial side of the forceps, and dividing one layer of peritoneum with scissors. As the result of this incision the neck of the sac now lies clear, held by the forceps on the outer side of the sac. The neck of the sac has in this way been completely exposed and freed without dissection. A gauze swab is gently passed down the outer and inner side of the sac. A gentle pull is then made upon the neck of the sac whilst it is ligatured as high up as possible. By separating the crista forming the neck of the sac in the manner described, and pulling upon the sac, it has become possible to ligature the peritoneum forming the neck of the sac, about 2 inches above the internal ring. When the sac is cut off distal to the ligature, the elasticity of the peritoneum will displace the ligatured sac well behind the rectus muscle. In cases in which a large internal ring or very thin peritoneum renders a recurrence more possible, the conjoined tendon is drawn over the cord and sutured to Poupart's ligament without enlarging the wound.

Coley's comment on Hull's operation is as follows:

"In view of the fact that in the Bassini operation we have a procedure that has been well tried out, that has stood the test of now nearly 30 years of world-wide experience, that has given in the hands of skilled operators 95 to 99 per cent of permanent cures, I believe we are hardly justified in abandoning the Bassini operation and substituting in its place the operation advocated by Colonel Hull until we have further data as to the permanence of the results. Moreover, I can see very little to be gained by such substitution. The Bassini operation can be performed perfectly well under a local anesthetic; it can be performed by skilled operators in from eight to fifteen minutes, and it does not require more than ten days or two weeks of confinement in bed. Colonel Hull states that if a patient has a recurrence following his operation, then the Bassini operation can

be perfectly well performed. Just how many cases have required this second operation he fails to state.

"Aside from the fact that the length of the skin incision is of minor moment, that small incisions always imply more deep trauma than do large, that the neck of the sac cannot be exposed in the simple way described, and that through such a cut placed as indicated to suture the conjoined tendon to Poupart's ligament would be difficult and uncertain; it is quite true that many of the hernias in young men require for their cure only the removal of the sac, since the condition is dependent not upon muscular weakness or a weak attachment, or fascial relaxation, but solely and entirely upon the presence of a hernial sac. In those cases of direct hernias which are observed in older men, and in those cases in which the hernia is due to the narrow attachment of the internal oblique and transversalis to Poupart's ligament, apparently such a procedure as described by Hull would seem entirely inadequate. The proof of the method, however, lies in its clinical test. Until many more cases are reported it would be unwise to draw conclusions as to the value or the reverse of this procedure. It is probable that this method will not become a routine one, although there can be no doubt that in certain instances it will be highly expedient and entirely efficacious."

REPORTS ON THERAPEUTIC PROGRESS.

THE USE AND ABUSE OF HEROIN.

To the *New York Medical Journal* of April 6, 1918, H. A. HARE writes as follows:

In the issue of the *New York Medical Journal* of March 16, 1918, there is published the recommendations of the Public Health Committee of the New York Academy of Medicine and of the New York Psychiatrical Society concerning drug addiction. The names of these organizations and the names of the men forming the committee carry so much weight that it is akin to "defying the gods" to question any one of the recommendations made. Nevertheless, Hare wishes to call attention to the first:

"We recommend that the Federal Government take such measures as are feasible to abolish the manufacture of heroin altogether."

Hare thinks that there can be no justification of this sweeping and unqualified statement, unless it can be shown that this drug does more harm than good, and it is questionable whether any drug which possesses virtue, when properly used, should be taken away from physicians who treat persons needing it, because a number of weaklings suffer from its abuse, particularly if the present antinarcotic laws are enforced. Heroin is a drug which has proved its value or it would not be in existence to-day. That it is largely used in legitimate medical practice is proved by its admission to the U. S. Pharmacopœia, for drugs are not so admitted until they are so generally prescribed as to be worthy of admission. A large number of physicians believe they get results from heroin which other so-called opiates do not give, both in children and in adults, and it does not seem proper to deprive some people of relief because the law is not enforced. If it could be proved that heroin was used practically not at all in legitimate medicine and that nearly all of it was used by habitués, then the small number benefited as compared to the large number hurt might justify its abolition. Before this can be done there should be definite facts and not opinions before us. Dr. Stokes, the former Surgeon-General of the U. S. Navy, in an article in the *Journal of the American Medical Association* of March 16, 1918, said at a public hearing in New York it was stated that there were 1,000,000 drug users in New York State, and then quotes M. I. Wilbert, formerly of the U. S. Public Health Service, who says

the number is 175,000 for the whole United States, which latter figures were based on the sale of opium through trade channels. Such differences of *opinion* are evidence of lack of facts. It is a grave question whether the abuse of heroin produces all the evils for which it is blamed, and whether the addict has not a "twisted morale" before its use is begun.

Practitioners of medicine need every serviceable drug they can find, for one remedy suits one patient and another remedy the next case. Before a drug which is widely used is "wiped off the map" by Federal legislation, even if we suppose that this is the right way to go about it, would it not be well to find:

1st. How many persons abuse heroin?

2d. How many of these persons are so constituted that if they did not abuse heroin they would abuse something else?

3d. How many of these present symptoms which are not due to heroin, but to individual defects?

4th. How many physicians use it lawfully?

5th. How many patients are relieved by its use as compared to the number actually damaged by it?

6th. Why the antinarcotic laws, so-called, fail to meet the difficulty? If they do for heroin and not for other opiates, it would appear that this drug must possess qualities which when properly used would be of great value to the sick.

A SIMPLE METHOD FOR THE RESUSCITATION OF THE HUMAN HEART.

In the *American Journal of Physiology* of March 1, 1918, HIRSCHFELDER tells us that observation of exposed dogs' and cats' hearts shows that death ensues in three ways—either the ventricles go into fibrillation, or they cease to contract and at once lose their irritability entirely, or they may cease to contract and yet for some time retain their ability to carry out a forcible contraction in response to mechanical stimulation. Such a stimulation may be furnished by directly slapping the ventricles with a blunt instrument or by suddenly pressing the ribs and chest wall down upon the heart. If this is done rhythmically at a rate of thirty to sixty times a minute the heart may respond to each stimulus, the circulation may be reëstablished, and spontaneous cardiac rhythm may then be resumed.

The writer carried out this procedure successfully in one case of stoppage of the ventricles in a patient with Adams-Stokes syndrome in which the stoppage of the ventricles was unusually prolonged. The convulsion and respiration had entirely ceased and the patient seemed beyond hope of recovery. The ribs and chest wall were then seized between the two hands, the right hand at the back, the left hand over the precordium, and the chest was forcibly compressed between them at a rate of thirty to forty times a minute, thus pressing ribs and chest wall suddenly down upon the ventricle. The heart responded at once to each stimulus with a contraction, circulation was rapidly resumed, the patient recovered and was living two years afterward. The maneuver has been repeated as a routine upon the hearts of dogs and cats used in the laboratory experiments in which the hearts had been exposed by removal of part of the chest wall, and where the results could be watched with the eye. It is often successful in restoring the circulation. The rather slight stimulus offered when the chest wall is pushed suddenly down against the heart, without in the least subjecting the latter to compression, suffices as a mechanical stimulus to bring about contraction. This maneuver is, therefore, a justifiable procedure for the resuscitation of hearts which have stopped beating for a minute or more, and which are apparently beyond hope of the ordinary forms of stimulation. It is simpler and more readily applied than massage across the diaphragm or electric stimulation after the introduction of a needle into the heart.

[We have referred to this method in human beings a number of times in leading articles. It is by no means new.—ED.]

ANGINA PECTORIS.

In the *Journal of the American Medical Association* of April 6, 1918, INGALS and MEEKER state their belief that during the attack, if prolonged and severe, morphine, or morphine and atropine, given together hypodermically, are the most common remedies. They are undoubtedly necessary in many cases, but they usually disturb the digestion and make the patient feel badly for two or three days, so that it is much better to give the nitrites first and rely on them when they will answer the purpose. Whisky in quantities of about 3 ounces will also give relief. Hot applications over the sternum, as an electric pad, are sometimes helpful in relieving pain. Balfour recommended chloroform to be inhaled from a wide-mouthed bottle in which about a drachm had been placed on a sponge. The bottle was to be held in the patient's hand so that, as he came under the influence of the anesthetic, the bottle would drop and roll away. Allbutt considers chloroform dangerous. The writers do not know its value from personal experience in angina pectoris, but they have found this method of administration very effective and safe in some other painful conditions.

On account of its reputed effect in contracting the arterioles, digitalis is not suited to relieve an acute attack. In those cases in which the heart's action remains practically normal, it is distinctly contraindicated. When the heart's action is feeble, however, this remedy and nux vomica are indicated. The two together will often yield results that cannot be obtained by either one given alone. One patient tried digitalis repeatedly, but became convinced that at times it made him worse, although he never had high blood-pressure. In sixty cases Ingals observed, in which the condition of the heart and pulse was recorded, the heart was apparently normal in thirty-six cases, and the pulse did not exceed 85 in twenty-six cases. In only eleven cases did the myocardium or valves appear to be involved, in only nineteen did the pulse run from 85 to 90, and in only twelve did it run higher than 90 at the time of Ingals's examination.

To prevent the attacks, it is of first importance that the patient live a regular life, and avoid overexertion, mental excitement, chilling of the surface, and, indeed, anything that brings on pain.

Moderation in eating should be enjoined, especially on those who are overweight, and mild measures for reducing the obesity should be instituted. Tobacco, coffee, and sometimes even tea should be avoided. Flatulence should be relieved by such remdies as rhubarb, gentian, and the carminatives, as peppermint, cardamom, and ginger. The *Bacillus bulgaricus* has been quite effective in preventing flatulence in some persons. The secretions must be free and the bowels must be kept open.

Rest, especially in the early stages or when the attacks recur frequently, is of the utmost importance; but the patient's temperament must be considered, and the physician must not demand what to the patient seems impossible. Ingals is impressed with the idea that rest and diversion with graduated exercise are the greatest factors in the beneficent effects of baths of the type given at Nauheim. Essentially the same baths may be given at home, by adding nine pounds of sea salt and ten ounces of commercial calcium chloride to forty gallons of water. Calcium chloride is probably the most essential ingredient. The carbonic acid gas appears to Ingals negligible except for its psychic effect.

Ingals believes improvement is due first to the free use of nitroglycerin, partly to the heart tonics, partly to the care in diet, and largely to the hour and a half or two hours' rest every afternoon, added to the eight hours at night.

The pain in angina pectoris is not usually in the heart and the left arm, but rather along the course of the aorta and larger arteries.

The pain appears, at least in many cases, to have no relation to the condition of the myocardium or to the obstruction of the coronary arteries.

A more hopeful prognosis than that of

the usual conception of this disease may be assured under proper care and treatment, a very important part of which is abundant rest with heart tonics as needed.

The sublingual administration of fresh hypodermic tablets of nitroglycerin in large amounts to relieve pain is of great value. The failure of nitroglycerin is most often due to the wrong mode of administration, deterioration of the preparation, and inadequacy of the amount.

ANESTHESIA FOR PAINFUL SURGICAL DRESSINGS.

A military observer writes to the *Military Surgeon* for April, 1918, a report of an inspection trip abroad. In its course he says that in the dressing of painful wounds a very valuable method of anesthetizing the patient is used without danger even though required daily. The formula of the anesthetic is as follows: Ethyl chloride, 5 Cc.; chloroform, 1 Cc.; ether, 24 Cc. A piece of flannel cloth is saturated with the entire amount and placed over the patient's face, this covered with another piece of flannel, and this in turn covered with oiled silk containing a small aperture, fitting over the nostrils. This is tied around the patient's face with a bit of tape or rubber tubing. The anesthesia produced will last for ten minutes and the dressing can be started on the second breath. This anesthesia is apparently devoid of danger, is not accompanied by unpleasant complications, is followed by no deleterious after-effects, and is welcomed by the patient.

SOME PROBLEMS IN STARCH DIGESTION IN INFANCY AND CHILDHOOD.

In the *Archives of Pediatrics* for March, 1918, FLEISCHNER states that diet and hygiene are all that are needed in the treatment of this condition unless the anemia, which can always be met by appropriate means, is severe. No mention has been made of the so-called digestants because their value is, to say the least, very questionable. What the future may prove concerning the problem of deficient ferments as an etiological agent in the carbohydrate disturbances of childhood one cannot tell, but in the light of our present knowledge this relatively uninvaded field of medicine must assume a minor rôle.

Emphasis should be laid upon several very important facts:

1. That incapacity to properly handle starches and celluloses is a very common disturbance of the digestive tract of young children.

2. That a correct diagnosis can only be made by eliciting a careful history, ruling out other organic diseases by careful physical examination, and finally by painstaking stool analyses.

3. That the treatment of this condition is essentially confined to an adjustment of diet and institution of proper hygiene.

4. That it is high time that pediatrists who have devoted so much attention to a careful supervision of the diet of the first years of life should realize that it is quite as important to carefully regulate the diet between the first and sixth years of life, not only qualitatively but quantitatively, as the most potent prophylactic means of eradicating a very common form of malnutrition of childhood.

THE VALUE OF ROENTGEN RAYS AND BENZENE IN THE TREATMENT OF POLYCYTHEMIA VERA.

To the *Journal of the American Medical Association* of April 20, 1918, HURWITZ and FALCONER contribute a paper in which they state that experimental and clinical observations concerning the effect of drugs and various radioactive substances on the blood and blood-forming organs have brought forth some interesting facts regarding the relative resistance to these agents offered by the white blood-cells and the red blood-corpuscles. In the first instance it has been shown that the various drugs and rays employed exert a selective action on the several tissues giving origin to the formed elements of the blood; and secondly, that the leukopoietic tissues are much less resistant to their destructive action than are the

tissues concerned with the formation of erythrocytes. The latter elements, it would appear, show only moderate changes in number and structure at a time when the circulating leucocytes may have almost completely disappeared from the circulation.

The observations of Heinecke and Selling have established these facts, so far as the action of the Roentgen rays or of benzene is concerned. This work shows that the Roentgen rays exert a selective action on the lymphocytes, and that even a prolonged irradiation will not bring about any noteworthy changes either in the number of red blood-corpuscles or in the percentage of hemoglobin. Benzene, on the contrary, has a somewhat different action. This drug has been shown by Selling to act destructively first on the white cells and more especially on the non-granular elements, and later to cause a diminution in the number of erythrocytes. The experimental studies have shown, however, that in order to effect any striking anemia, the drug must be administered in large doses and over a long period of time.

It is because of this essential lymphotoxic action that the Roentgen rays alone have not been found of great value in the treatment of polycythemia. Whereas benzene, on the other hand, has yielded some brilliant results in the treatment of this disease, it must be kept in mind that these good effects have usually followed the prolonged ingestion of large doses of the drug—a procedure not entirely without danger. The danger lies, first, in the severe gastrointestinal disturbance which may follow the administration of very large doses; and secondly, in the marked destructive action which these large amounts may have on the circulating leucocytes.

It was with the hope of testing the value of smaller amounts of benzene, when combined with the Roentgen rays, that the mode of treatment outlined in this paper was carried out. The patient received only 44 gm. of the drug within a period of a month, after which the benzene was stopped. The Roentgen-ray treatments, however, were continued about two months longer. Although considerable reduction in the red count followed the use of benzene alone, the erythrocytes began to approach the normal level only after the seventh Roentgen-ray treatment.

The good effects of the combined treatment may be attributed either to the joint action of both measures, or to the delayed and cumulative action of the benzene itself. It does not appear likely that the latter measure can be the cause, since previous observers did not succeed in reducing the red count appreciably with the amount of benzene administered to the writers' patient. The writers are, therefore, inclined to attribute this successful therapeutic result to the combined action of both agents. But the manner in which the Roentgen rays may have served as an adjuvant to benzene therapy in this instance is not quite clear. The writers venture the suggestion, however, that the Roentgen rays may act in a more destructive manner on erythropoietic tissues, which have been rendered less resistant beforehand by the toxic action of benzene.

ETHER-OIL COLONIC ANESTHESIA.

LATHROP in the *New York Medical Journal* of April 13, 1918, lauds this method in certain cases and tells us that the method of inducing anesthesia which he follows almost invariably is as follows: One hour before the time set for operation the patient is given by rectum one or two drachms of paraldehyde, two and one-half drachms of ether, and one drachm of olive oil. These should be thoroughly mixed in a small bottle before administration. Twenty minutes after this is given, a hypodermic of ¼ grain of morphine and 1/150 grain of atropine is administered. Then he waits twenty minutes and gives three ounces of ether thoroughly mixed with one ounce of olive oil. This should be given slowly at the rate of one ounce per minute. The rectal tube should be clamped and left in the rectum until the operation is completed, when the bowel should be carefully and completely irrigated until the solution re-

turns clear and practically free from the ether-oil mixture. Any mixture remaining may be helped in its removal by a gentle massage of the colon. A pint of water of a temperature of about 90° F. is then put in the bowel and left there. To illustrate: At 9 A.M. the patient receives the mixture of paraldehyde, ether and olive oil as mentioned above. At 9.20 the hypodermic of morphine and atropine is given. At 9.40 the ether in oil mixture is slowly administered as already stated. At ten o'clock the majority of patients are ready for operation.

In the case of an alcoholic, we may omit the preliminary rectal administration given above, and use instead 1/100 grain of hyoscine hypodermically two hours before operation, and repeat this with ¼ grain of morphine, one hour before operating, and follow with the oil and ether, as already mentioned. Children under ten or twelve years of age need no preliminary treatment, aside from laxative and enema. It is important not to insert the tube more than five inches within the bowel. The Sims position is the correct one. Lathrop has found that where one person has sole charge of this work, the quantity used has been greatly reduced and adequate anesthesia maintained. It is important that the use of ether-oil mixture may be in the hands of one who can begin its administration, and have it under his or her care in all cases, and not delegated to a different doctor or nurse each time it is used.

Should narcosis be slow, or the patient restless, as will occur now and then, a few whiffs of ether will quickly produce sleep; usually one or two drachms is ample, as already mentioned. The breathing, as a rule, is quiet and regular, pulse normal, and reflexes not disturbed. Should there be loss of lid reflex, cyanosis, or stertor, it is an indication to withdraw one or two ounces of the mixture from the colon. Should respiration be arrested, of course artificial respiration would be indicated, as in any similar condition under inhalation anesthesia, and the mixture withdrawn. Dr. Gwathmey has lately experimented with a preliminary mixture of ¼ grain of morphine, two drachms each of bromide of potassium and paraldehyde, and water to make four fluidounces, injected one hour before operation. This is followed at the proper time by one ounce of a 65-per-cent mixture of ether in oil or one ounce to forty pounds of body weight. Lathrop has tried this out in a few cases, but has found his own method to be far more satisfactory, and he uses it exclusively. Experiments have shown that two drachms of paraldehyde used this way seem to equal two ounces of the 75-per-cent oil-ether mixture: thus the amount of oil-ether has been greatly reduced in Lathrop's experience.

For children, the oil-ether should be used in equal parts, as advised by Gwathmey. Lathrop has never used it as yet in the young. The fact that you can anesthetize a patient in bed, remove him to the operating-room, and perform an operation, without the patient realizing what has taken place, surely is a feature of this method that must appeal to any surgeon who has to deal with any patient who is nervous, high-strung, and apprehensive of danger. Especially is this true in cases of hyperthyroidism or in those who have not yet reached the toxic stage, but are near enough to be exceedingly nervous and depressed. It is of value in conditions such as asthma, where the inhalation method is often accompanied by choking and cyanosis. In fat subjects with short, thick necks it is well worth trying and most efficient.

The principle of anociassociation can be realized by this method, as far as calmness and the indifference of the patient is concerned, and nerve blocking by the use of novocaine, as advocated by Crile, can be carried out if desired. In the nervous type seen in hyperthyroidism, after the usual preliminary treatment by rest and medication, when the time is set for operation and not known by the patient, it is the custom to give each day or second day for a week previous to and leading up to operation an injection of four ounces of water containing a drachm of ether; this the patient is told is for tonic purpose and is to be retained. On the day of the operation the

patient is given the regular course as already mentioned, and the operation is then performed with little if any knowledge on the part of the patient. By this method postoperative nausea is reduced to a minimum, as are gas pains. There is little or no mucus, and the ether is less irritating to the colonic membrane than the vapor is to that of the respiratory tract. The safety limit is extended by the gradual absorption of ether by the colon and its rapid elimination from the lungs.

It is of interest to note that Dr. W. H. Park, of the New York Department of Health, found that an ether in oil mixture killed the colon bacillus in one minute. "As the colon bacillus is an important infective agent postoperatively, the ether-oil solution acts as a desirable prophylactic agent against possible infection." Lathrop does not advocate this method for general surgical work, as the time required for its proper technique would prohibit it where a number of operations are scheduled, and for routine use he sticks to inhalation or to local anesthesia. However, he has operated frequently for hernia and various abdominal conditions, in order to test out the procedure in every way.

For head and neck work, especially goitres, it is Lathrop's firm belief that it is supreme over any other method, and further, as demonstrated by Gwathmey, the factor of safety is the wide margin between the dosage required for surgical narcosis and that which produces toxemia. When thoroughly mixed before administering, we have a preparation in which each molecule of ether is bound to one of oil, and this union is broken only when vaporization occurs. When anesthesia is established it is automatically maintained by the ether separating from the oil according to well-known physical laws, and this vaporization is constant, so that you do not have deep anesthesia at one time and light at another, unless deepened by rebreathing or lightened by an airway tube. The ether and oil should be thoroughly mixed by shaking in a bottle for one minute, as recommended by Lumbard.

Lathrop has used the ether in oil method continually in all goitre work, and after an experience derived from several hundred cases of all varieties of goitre, and over 100 of various abdominal conditions, it is his opinion, to sum up the subject, that:

1. It is most valuable in head and neck operations.

2. It eliminates the fear seen in so many cases.

3. There is less tax on the lungs and kidneys, and nausea and vomiting are greatly reduced.

4. Operations can be done with little or no knowledge on the part of the patient, while Crile's technique can be carried out if desired.

THE TREATMENT OF CANCER OF THE LIP BY RADIUM.

In the *Journal of the American Medical Association* of April 13, 1918, JANEWAY records the results of this plan of treatment and expresses the belief that the degree of success that he has obtained in the treatment of operable cancer of the lip by radium in a series of cases, and the maintenance to date with such regularity of the healed condition in the earlier cases treated, justifies a continuation of the use of radium in operable cancer of the lip. It may be that lapse of time will require some modification of this judgment. This method of treatment includes the careful observation of the patients after treatment for the possible development of metastatic lymph nodes, and the operative removal of such when they occur, with the implantation of radium in the wound. Janeway believes that the treatment of cancer of the lip by radium will encourage earlier attention to this disease by the patient.

He recommends the application of radium emanation embedded in molds of the dental compound, and filtered through the thinnest material for the most superficial lesions. As a matter of convenience he has used 0.5 mm. of silver uniformly for all but the lesions with deep infiltration. While 0.5 mm. of silver has been unnecessarily heavy

for the most superficial lesions, it has given uniformly satisfactory results in Janeway's cases. For the deeper lesions, however, nothing has surpassed the progressive, smooth and complete retrogression produced by filtration through 1 mm. of platinum. The tubes should be sunk 5 mm. in the dental compound, and for the ordinary lesion the dose should be 60 millicurie hours per square centimeter, when the filtration is through 0.5 mm. of silver, and 100 millicurie hours per centimeter when through 1 mm. of platinum.

The use of emanation instead of radium element facilitates uniform distribution over the lesion. Provision for uniform distribution is the most important factor in obtaining a successful result. It is true that it is possible to approach the uniform distribution obtained by emanation with the radium element, provided this is put in many minute tubes; but few users of radium element find it practical to divide their radium thus, and the attempt to treat these lesions by merely placing on them single tubes of radium element is inaccurate and often inadequate.

The superior adaptability of radium emanation for the treatment of cancer makes the use of the element itself obsolete, and for the vast majority of cancers it is inefficient.

QUININE IN THE TREATMENT OF ANAL FISSURE.

To the *British Medical Journal* of March 16, 1918, LEYTON writes as follows:

"In the present circumstances it seems more than desirable to record, for the use of other practitioners, any slight advance in treatment which will save time and trouble to patient and doctor.

"A typical case of anal fissure came under my care and refused operative treatment. There were tuberculous glands in the neck, a pile, and a fissure a quarter of an inch deep extending upward from the base of the pile for more than an inch and a half. After trying the usual palliative remedies without result, and remembering the granulating power of quinine, I packed the fissure with quinine hydrochloride (about five grains) after swabbing with cocaine solution. This treatment was repeated on each of three days. In twenty-four hours the surface showed well-marked granulations, and the patient's symptoms were much relieved. She slept all night after having had pain, severe enough to prevent continuous sleep, for ten days.

"After the third day that part of the fissure within reach was looking healthy, but the patient complained of pain higher up. I therefore prescribed a suppository of cocaine grain ¼, to be followed in a quarter of an hour by a suppository of quinine sulphate grain 5. These were used in four days, and by that time the fissure was quite healed and all pain and symptoms had disappeared; there has been no recurrence."

TREATMENT AND PREVENTION OF DEFECTIVE HEARING.

PFISTER in the *Wisconsin Medical Journal* for April, 1918, presents these statements:

That almost all ear troubles attack the human being by way of the nose, the nose having a communication with the ear.

That very few diseases of the ear come by way of the outer ear.

That a stuffed-up nose always means grave danger to the ear and the hearing; because the ear cannot drain naturally and the forced efforts to clear or open the nose must surely bring ear trouble.

That in la grippe, infectious colds, scarlet fever, measles, etc., it must be the first duty to endeavor to keep the nose open with weak solutions of adrenalin dropped in the nose every hour, while patient is lying down, and to stop hard blowing of the same, usually practiced by the patient.

That all those so frequently practiced methods of douching the nose are as a rule faulty, and that they will contribute to poor hearing.

That all obstructions in the nose and postnasal space, principally adenoids, and

also enlarged tonsils, must be removed in time, before the damage has been done.

That all shops and factories should be interested in an effort to limit heavy noises or insist on some protection against them.

That all street noises be cut down to the absolutely unavoidable limit.

That parents take the trouble to repeatedly examine each ear of each child as to the distance at which children can hear the speaking and whispering voice, and

That discharging ears are a severe danger to the life and particularly to the hearing of a grown-up person as well as of a child.

That such statements as "The child is too young," or "It will outgrow it," or "Nothing can be done," or attributing deafness to advanced age, on the part of those not able to judge, are extremely vicious and destined to prevent the elimination of one of the most severe afflictions of mankind.

That young mothers must carefully avoid getting water in the children's ears, either in washing or bathing them.

That a greased plug of cotton in the ears is the best protection for the ear while diving or swimming.

THE COLLAPSE TREATMENT OF CONSUMPTION.

The *British Medical Journal* of March 16, 1918, writes editorially on this subject. It reminds us that many years ago the late Dr. Cayley published a case in which he had been able to check a severe hemorrhage from the lung by the induction of artificial pneumothorax. The diseased lung on the affected side became collapsed, and the immediate danger of death by bleeding was averted. The proceeding, although obviously successful, was at the time regarded as heroic, and no further cases appear to have been recorded In 1882, however, Dr. Forlanini of Pavia brought forward the suggestion that in certain cases of advanced unilateral tuberculosis of the lung it might be possible to arrest the spread of the disease by the artificial production of collapse of the affected organ. Six years later he made known his first results, which led to favorable conclusions. In 1898 Dr. Murphy advocated a similar line of treatment, and in 1906 the method was being used extensively, especially in the German clinics.

Since 1906 a very large number of cases have been treated, and an interesting report on the whole subject has been made by Dr. W. N. Beggs, of Denver, Colorado, and Dr. C. L. Minor of Asheville, North Carolina, who have both had extensive practical experience. On all main points it agrees with that of former workers in the same field, and it may be noted that, as regards immediate relief to present symptoms, the induction of collapse of the diseased lung is undoubtedly successful, and especially so in cases of persistent hemorrhage. Cough and sputum, pyrexia, sweating, and other evidences of systemic poisoning rapidly disappear, and for a time, at any rate, the disease appears to be checked. These happy results, however, do not occur in all cases; hence the greatest care is needed in the selection of cases in order to avoid the many risks that attend the method The most favorable case is that of unilateral disease, limited to the upper lobe, in which there is reason to believe that no pleuritic adhesions are present to prevent collapse of the lung when the pleural cavity is filled with nitrogen. So successful have some of these cases proved that the suggestion has been made to induce pneumothorax in the early stages. The procedure, however, is not free from danger, even in skilled hands, and the published results of natural arrest of incipient disease are so good that this idea has not been pressed, except by a few enthusiasts.

In the great majority of cases it is extremely difficult, even with the aid of the skiascope, to ascertain with any approach to certainty the presence or absence of adhesions. In very many instances the treatment has failed because the adherent lung has not been in a condition to collapse, and it may well be inferred that such failure has entailed a good deal of suffering to the patient and disappointment to his medical

adviser. Hence there should always be a clear understanding as to the actual risks that have to be faced. If the disease is advancing rapidly and is as yet limited to one side, there would seem to be very reasonable hope of benefit, both immediate and future, and records prove that the disease may be arrested and full working capacity restored after a prolonged period of treatment. In such instances the collapsed lung ultimately expands again, but such expansion is of necessity slow. In the less definite cases the degree of success or failure must depend upon the capability of the lung to shrink and upon the integrity of its fellow. The cessation of active disease on one side has sometimes been followed by increased activity on the other, and this possibility must always be borne in mind. The paper to which reference is made contains numerous instances of untoward happenings, not due to neglect, but arising from causes due to imperfect diagnosis of the actual conditions present.

The conclusions to be drawn are that in a limited class of cases a genuine arrest of the disease may be brought about by putting the whole lung out of action for a period, and that in less favorable instances a great deal of present relief may be afforded, even though life be not greatly prolonged. But there are many considerations to be weighed before so serious a procedure can be adopted in doubtful cases. Manipulative skill and scrupulous care in applying it are essential, and hence the treatment can only be satisfactorily carried out by experts. Even in the most experienced hands, and with all possible care to prevent mishaps, the course of recovery is often checked by such occurrences as hydropneumothorax or pyopneumothorax, or by the development in the compressed lung of abscesses which burst into the pleural cavity, and by other unavoidable accidents. The collapse treatment is likely to be more widely adopted as years go on, as brilliant successes are from time to time recorded, but present experience would seem to limit its use to unilateral and strictly localized lesions.

TECHNIQUE OF NITROUS-OXIDE-OXYGEN ANALGESIA AND ANESTHESIA IN NORMAL OBSTETRICS.

In the *California State Journal of Medicine* for April, 1918, CAROLINE PALMER states that the technique of N_2O,O analgesia in normal obstetrical practice is now fairly uniform. It consists of the administration of N_2O with varying percentages of oxygen for each individual pain to a degree sufficient to abolish suffering without disturbing consciousness, until the perineal stage is reached, when continuous analgesia is usually indicated. The gas is given at the first suggestion of the uterine contractions so that the analgesia may precede the pain. The amount of gas required and the percentage of oxygen vary considerably with the individual patient, the point being to give just sufficient gas to control the pain with enough oxygen to prevent cyanosis. Too much oxygen will produce excitement, too much gas will induce anesthesia. A frequent method is to give three breaths at the beginning of each contraction, the first two being N_2O only and the third containing 4 to 6 per cent of oxygen. The respirations should be fairly quick and the patient instructed to hold the third breath for a considerable time, whether it is desired to have her make voluntary muscular effort or not. The number of respirations sometimes must be increased to 5 or 6, but whatever the number the last breath should be held. Occasionally less than three breaths will be sufficient. Recently Palmer had a patient who was completely anesthetized after three breaths, became wildly excited after two, and had analgesia after one. Palmer therefore continued her analgesia with one inhalation at the beginning of each pain until the pains became more frequent and severe, when two breaths were required, then three, and for the perineal stage she had continuous analgesia with 8 per cent N_2O and 20 per cent oxygen.

Whatever the number of breaths required, it is a safe practice to add a small amount of oxygen after the first two or three. As the pains become longer it is well to hold the

inhaler in such a way that additional breaths of gas may be given if necessary. For these later inhalations most observers agree in the use of a larger percentage of oxygen. It is Palmer's custom to use the same percentage here as for continuous analgesia—*i.e.*, N_2O 80 per cent, oxygen 20 per cent. As soon as the head is delivered, it is well to increase the oxygen to 30 or 40 per cent, and immediately after the child is born to give the mother a few inhalations of pure oxygen. Pure oxygen cannot be breathed with safety for more than a brief interval, but Palmer has had very gratifying results by the administration to the mother of oxygen from a low-pressure cylinder for some five minutes before the cord is cut. The oxygen is simply added to the air by placing in the patient's mouth a metal mouthpiece connected with the wash-bottle of the oxygen tank. Should the baby be cyanotic from prolonged pressure, cord around neck, or any other reason, it is interesting to see how quickly the cyanosis will clear up under this procedure. Palmer makes a routine practice of administering oxygen in this way regardless of what anesthetic has been used for the delivery.

The success of nitrous-oxide-oxygen analgesia depends upon the ability of the anesthetist to adapt the administration to the needs of the individual patient, upon being able to secure the patient's confidence and coöperation, upon the degree of intelligence of the patient, the quietness of the room, particularly the absence of disturbing conversation, and last, but by no means least, team-work between the obstetrician and the anesthetist.

Given a skilled obstetrician, an experienced anesthetist, and proper team-work, there should be no failures.

Palmer entirely disagrees with all who advocate the haphazard administration of nitrous-oxide-oxygen by any one who happens to be available, also with those who advocate self-administration except under the direction of a competent person.

Dr. Skeel says in the *Journal of the American Medical Association:* "I wish to enter a vigorous protest against the advice at present being so freely given that any one may use gas in labor cases with perfect safety. Gas is a powerful therapeutic agent with infinite possibilities for harm at the hands of incompetent or careless users. The statement has been made and is, I believe, accepted that gas in the hands of an expert is a safe anesthetic, but the *most dangerous* anesthetic if given by a novice. Of course this is far too strong a statement to make concerning analgesia. Even here, however, some knowledge and experience are necessary to secure both safety and satisfaction from its use. The skill necessary for its use in labor can be acquired in a short time, but free use of gas by the absolutely inexperienced will surely lead to tragedies."

The use of N_2O and air instead of N_2O and oxygen has been advocated by many on the ground of economy and the simplicity of apparatus which may be employed.

Guedel calls attention to the fact that "under individual pain administration the babe *in utero* receives but little N_2O from the mother, no matter how great may be the excess of gas in the mother's blood during the acme of contraction." He adds: "During the period of induction when the gas is entering the blood of the mother, the uterus is contracting so that there is little if any interchange of fetal and maternal blood. The babe lives during the uterine contraction upon well-oxygenated placental blood accumulated between pains. The anesthetic is removed at the acme of contraction, and as only ten to twenty seconds are necessary for the removal of the excess N_2O from the blood of the mother, it becomes evident that the blood of the fetus receives but little nitrous oxide at any time. By the time the uterus is relaxed sufficiently to permit an interchange of blood through its walls, the blood of the mother is almost free of nitrous oxide and is again well oxygenated."

The question of rebreathing is of importance because of economy and because it serves to warm the gas. Too much rebreathing however is apt to cause nausea and headache. In Palmer's work she has better results without rebreathing for inter-

mittent analgesia, and with only fractional rebreathing for continuous analgesia and anesthesia.

The expense of nitrous-oxide analgesia is reported by various investigators as all the way from 57 cents to $5 per hour. The difference is mainly due to the price of gas in the particular locality from which the report originates, the kind of apparatus used, whether air or pure oxygen is used with the nitrous oxide, and whether or not rebreathing is employed. The gas in the largest cylinders is the least expensive.

By using the large cylinders, an apparatus in which the flow of gas is automatically shut off except when the patient is inhaling, looking carefully after all possible leaks and keeping the apparatus in perfect working order, Palmer has found that even at the comparatively high price of gas on the Pacific coast she is able to give gas for obstetrical analgesia and anesthesia at a cost to each patient of $2.50.

REPORT ON NEUROCIRCULATORY ASTHENIA AND ITS MANAGEMENT.

To the *Military Surgeon* for April, 1918, LEWIS makes a long report on the state first called by Da Costa in 1864 the "irritable heart of soldiers." He wishes it called neurocirculatory asthenia or N. C. A. He gives the following summary of his views:

1. An affection known in civilian practice, but greatly exaggerated and very common among soldiers under the present war conditions, has been described, and a new name for it, neurocirculatory asthenia, is suggested.

2. The method of dealing with this large group of cases by the British army has been described, and its value in sorting, in therapy, in reducing hospital staff by half, and in establishing an equitable basis for pensioning has been sufficiently proven to recommend that the United States government adopt a similar plan should the same disorder become prevalent among the American forces.

3. All medical officers of the American forces should learn to recognize the clinical picture of this syndrome, and a certain selected number should have the opportunity of studying such cases and of learning by actual experience to employ a system of graduated exercises as a therapeutic measure and as an aid to categorization.

4. To limit the occurrence of this disorder in a prophylactic way it is suggested that—

(*a*) Measures be taken for the *early* recognition of cases of N. C. A.—*i.e.*, at the time men are called to service and at the training camps.

(*b*) Men who are seen to flag or show signs of breathlessness by their drill instructors should be reported to the medical officer and thoroughly overhauled from the point of view of this syndrome at an early date.

(*c*) The period of convalescence after infectious diseases be made sufficiently long, and, after complete recovery, the soldiers be gradually hardened before returning to full duty.

5. It is strongly recommended, above all, not to transport soldiers suffering from this disorder overseas for active service, as it is now well known that their period of service on full duty is short.

ELECTROCARDIOGRAPHIC DEPRESSION PRODUCED BY DIGITALIS.

Writing to the *Lancet* of April 20, 1918, CHAPMAN points out that if Harris's interpretation of the depression between R and T in some electrocardiograms in patients under the influence of digitalis in the issue of the *Lancet* of March 30 is correct, the observation is of great practical value. That the depression was more easily produced in "diseased heart muscle" cases tends to confirm the explanation. The value of the paper would have been enhanced if the age-groups of the patients had been given. It is well recognized that the distensibility of the chambers of the heart diminishes as age advances, from fibrotic changes in the heart muscle, consequently with these less depression should occur. On the other hand, a fatty heart should be prone to yield. Harris should continue

his observations and place the cases in two or three series according to age, etc.

Sir Samuel Wilkes in the "'70's" taught that the slowing effect on the pulse by digitalis was due to the tonic effect of the drug on the heart muscle whereby a number of frequent ineffective contractions are replaced by fewer and more effective ones. This beneficial effect was seen at its best in the condition now recognized as auricular fibrillation.

Dr. Harris incidentally raises the question of the relative value of large and small doses of digitalis. Chapman suggests that it is a good rule not to give more of a drug than is necessary to produce the required result, and there is, generally speaking, less risk in giving oft-repeated small doses than massive ones. When large or repeated doses of digitalis are prescribed it is well that the patient should be kept in bed until the effect of the treatment has been noted. This is especially important when the patient is not under close observation.

TREATMENT OF MALARIAL RELAPSE.

The *British Medical Journal* of April 13, 1918, states that Sir Ronald Ross, Consultant in Malaria in the War Office, has made a report on this subject to the Society of Tropical Medicine.

The trials with various forms of quinine treatment continued from March 23 to October 17, 1917. The various treatments tried were of four classes: (*a*) Antirelapse quinine prophylaxis given to 1040 old cases of malaria; comparatively small doses, amounting to about 60 grains a week, distributed in various ways, reduced relapses to about 10 per cent of the cases a month, and also diminished the severity of the relapses that occurred; 5 grains daily were less effective than 10, but 15 grains daily were no more effective than 10 grains daily, and were less well borne; (*b*) short sterilizing treatments; (*c*) long sterilizing treatments; and (*d*) mixed treatments, given to 1420 cases.

The trials showed the difficulty of sterilizing cases entirely, and that success tended to vary directly with the magnitude of the daily dosage. The best treatment for old cases of malaria was thought to be a system carried out by Captain Meredith Harrison, R.A.M.C., at the Connaught Hospital, Aldershot. It was used by him between July 10 and October 6, 1917, for forty-nine chronic cases of malaria, mostly of benign tertian, and mostly from Salonica. Of these only five had relapsed after the cessation of the treatment in October until the end of February, 1918. Three-fourths of these cases were examined after their original treatment at the Connaught Hospital once a week as regards clinical condition, blood, and weight; as most cases of malaria in the Aldershot command were closely in touch with the Connaught Hospital, it is thought that the number of cases given as relapsing is accurate. The percentage of cases relapsing was therefore only 10.2. The time which elapsed between the end of treatment and the beginning of the relapse (in the five cases which did relapse) varied from sixteen to seventy-two days and averaged 34.5 days. Captain Harrison reports that with this treatment the fever was reduced within from twelve to twenty-four hours, and that no asexual parasites could be found after forty-eight hours. The effect of the treatment as regards general improvement of health was good. The treatment was well borne by the patients, except for deafness and tinnitus, and there was very little vomiting. But the patients always object to stopping in bed for twelve days; and we are informed that this line of treatment is not yet to be definitely recommended until its effect on the sight and hearing has been more exactly measured.

The treatment was as follows: The patient was put to bed for twelve days and given daily throughout this period 15 grains of quinine bihydrochloride intramuscularly in each deltoid muscle, together with 10 grains of quinine hydrochloride in anticachexia mixture No. 1 thrice daily, totaling 60 grains of quinine daily for the twelve days. After this the patient was allowed up, and given for three days anticachexia

mixture No. 2 four times a day (60 grains of quinine daily by the mouth). After this the patient was given anticachexia mixture No. 3 four times daily for fourteen days (20 grains of quinine daily). He was allowed to do light work all this time. The prescriptions were as follows:

Anticachexia Mixture No. 1.

Quinin. hydrochlorid., grain x;
Tinct. ferr. perchlorid., min. v;
Liq. strych. (B. P.), min. v;
Liq. arsenic. hydrochlor. dil., min. v;
Acid. nitrohydrochlor., min. v;
Magnes. sulphat., drachm ss;
Syrup. tolut., drachm ss;
Glycerini, min. x;
Aquæ, add ounce j.

For a dose, to be given as directed after food.

Anticachexia Mixture No. 2.

As No. 1, but add

Quinin. hydrochlorid., grain v;
Acid. nitrohydrochloric. dil., min. v.

to the dose.

Anticachexia Mixture No. 3.

As No. 1, but reduce

Quinin. hydrochlorid., grain v;
Acid. nitrohydrochloric. dil., min. v.

in each dose.

A mixed treatment included the use of tartar emetic, acid arsenoids, sodium-quinine sulphonate, ethyl quitenine hydrochloride, and collosol quinine, but the results were not satisfactory.

Sir Ronald Ross also gave particulars of the results of inquiries addressed to a number of medical officers serving in Salonica: (1) Out of 111 officers who expressed definite opinions, 71 considered that 10 grains of quinine given twice a week as a prophylactic measure were of no value or were objectionable. (2) In reply to a question as to the optimum dosage for relapses in regimental aid posts, where patients may be retained for treatment for a period not exceeding three days, 63 per cent of the medical officers were in favor of 30 grains daily. (3) In reply to a question as to the optimum dosage for recurrent cases doing duty after being kept in regimental aid posts for a few days, the majority of the 107 officers who replied recommended fixed doses of quinine for periods varying up to three and a half months. The dose recommended varied from 10 to 30 grains daily, but some of the officers recommended the gradual reduction of the dose as the course progressed. (4) In reply to a question as to the optimum dosage for recurrent cases of malaria returned from hospital, 65 out of 105 officers advised the continuance of the same daily dose of quinine, and of these 33 advised 10 grains daily for from one month to three and a half months, twelve 20 grains daily for similar periods, and sixteen 30 grains daily. Others advised the gradual reduction of the quinine as the course progressed. Subsidiary treatment was recommended by many officers.

Acting Staff Sergeant M. Nierenstein made a large number of chemical examinations, and in an interim report states: "It seems more or less apparent that there is a tendency for the excretion of the quinine passed to reach a concentration of 7 to 11 grains per liter of urine. This appears to be the case for all salts experimented with (except the lactate), and the fact does not appear to be altered by the different methods of administration. Thus, these results flatly contradict all statements to the effect that quinine given intramuscularly or intravenously is more or less readily excreted than quinine given orally. Moreover, no one quinine salt appears to be more readily eliminated in the form of its base than another salt. These results have been obtained from 1366 analyses made on 624 different specimens; and have since been confirmed in quite a number of estimations accumulated during January and February, 1918."

THE PREVENTION AND TREATMENT OF MALARIA.

The *Lancet* of April 27, 1918, points out that the prevention of disease in the strict sense of the protection of an uninfected person from infection by means of prophylactic measures is a matter on which scientific evidence is badly needed. Quinine, for example, has been used among the English troops in varying dosage with this object in view, but we do not know of any record of experiments conducted with adequate controls in which, say, one-half of a certain

body of troops exposed to infection were given quinine and the other half were not. Had such an experiment proved the failure of a particular dose—*e.g.*, 5 grains daily—then it should have been repeated with 10 and 20 grains, or the test objects might have been divided into a corresponding number of groups. Thus within a period of weeks or even days the question could have been settled and the prevention of malaria by the routine administration of quinine placed upon a sound basis of experimental knowledge. In the absence of such knowledge the adherents and opponents of quinine prophylaxis still bandy words and quote the opinions of authorities in their support. It is something of a reproach to scientific preventive medicine that the matter is still in dispute. Malaria prophylaxis is a subject that may interest even in England.

A handful of indigenous cases of malaria were reported in 1917, most of which arose under conditions which the epidemiologist might have anticipated—viz., imported cases of the disease and the presence of anophelines. The latter exist in practically every country, and it is curious that although the requisite conditions were widely present only single cases occurred. A similar observation was made in France, where only isolated indigenous cases were noted. It has been argued on theoretical grounds that the number of anophelines is a factor of importance. Within certain limits this obviously must be so, but we have conclusive evidence that malaria may be intense in an area where the infected anophelines are scanty. Judging by last year's experience, it is unlikely that malaria will become epidemic in England.

So much for prevention. With regard to treatment, the heresy promulgated some years ago that intramuscular injections are not effective in controlling a paroxysm still survives. This particular statement appears to have been founded on an inference from the observation that quinine was found post mortem in the site of an injection. The skeptic who is not convinced by the experimental evidence already published would be well advised to take a series of cases showing simple tertian parasites in the blood during a paroxysm, to administer one or more intramuscular injections (even undiluted), observing the temperature chart and examining the blood after an appropriate interval. A personal experience such as this brings conviction.

It may be granted that the control of the malaria paroxysm is a simple matter, whether by intramuscular, intravenous, or by oral administration, but the cure of the disease is an entirely different matter. We are learning what the text-books did not tell us—that the cure of a simple tertian malaria is a most difficult matter, but we are becoming suspicious that our so-called quinine cures may not be entirely due to the drug itself, but rather to a naturally developing immunity. In one respect, however, our knowledge is more exact. Hitherto the methods of detection of quinine in the blood and its estimation in the urine were inaccurate. The new and accurate methods recently discovered permit of the reëxamination of the whole subject, and we hope for further light on the exact significance of quinine "habituation," if it exists, and the advance in practice which this knowledge would give.

TREATMENT OF FIBROID TUMORS OF THE UTERUS WITH RADIUM.

In the *Journal of the Medical Society of New Jersey* for May, 1918, KELLY makes an enthusiastic report on the use of radium in cases of uterine fibroids. He says he has found that practically every uncomplicated fibroid tumor of whatever size will be favorably affected by this comparatively new, non-surgical method of treatment, which will stop hemorrhage, together with menses, the latter either temporarily or permanently, and which will shrink the tumor or cause it to disappear.

Radiation has no mortality rate whatever *per se*. In this it has advantage over the radical surgical operation which has been the accepted method of dealing with fibroid tumors of the uterus up to the present time.

This, as a major operation, although comparatively safe in skilled hands, brings certain inevitable risks in its train. It is moreover a mutilating operation.

Between the dates of March 23, 1913, and January 12, 1918, Kelly treated 211 cases of fibroid tumor of the uterus with radium and operated on 45 cases, either because of some complicating condition or because operation was preferred.

Prior to radiation, Kelly excludes malignancy by curettage and histological examination. Appendicitis, cholelithiasis, and lateral inflammatory disease of the tubes and ovaries are also excluded, and Kelly makes sure as far as possible that he is dealing with an uncomplicated fibroid tumor of the uterus.

Of the 211 cases treated with radium, at the present time 87 are cured, the tumors having either entirely disappeared or reduced to insignificant size; 14 are so well that, in spite of repeated requests, they have failed to report for examination; in 62 instances the tumors have diminished in size. The last group is not static; it is composed largely of recently treated cases (less than two years) in which the radium has not had time to produce its full effect. The members of this group are constantly augmenting the first group.

In addition to these, 2 complicated cases are reported unimproved; 8 were operated on after radiation; 2 died of causes unconnected with the treatment; 12 have sent no report; 14 are too early for results; and 10 did not complete treatment.

If therefore we disregard the last four groups where the data are insufficient we have remaining 173 cases in which the results are known; in 163 of these radium alone has proved efficient. The remaining 10 will be considered somewhat in detail.

Two cases were reported unimproved, but one of these was complicated by gall-stones, and operation was advised and refused; the other was a huge tumor that choked the pelvis, making intrauterine radiation impossible, and only one abdominal radiation was given. Operation was done after radiation in 8 cases; in 3 the fibroid condition proved to be complicated by ovarian cysts; in 2 bleeding was not controlled by a single radiation, and, the patient desiring it, an operation was done in each case; in the remaining 3 cases there was insufficient reduction in the tumor mass. In one of these a calcified uterus was found, which suggests the value of *x*-ray to predetermine such a condition in women over forty. In the other two the tumors reduced, but remained sufficiently large to cause disagreeable symptoms.

The technique of treatment with radium is exceedingly simple. It consists merely of the application of 300 to 500 millicuries of the emanation, covered with a rubber cot, on the end of a uterine sound within the uterus for about three hours. It may be necessary to supplement this treatment with a similar one in a few months' time, or with an external abdominal treatment then or later.

For external treatment one or more milligrammes of radium are used, suitably filtered. The package is placed on the abdomen and shifted over different areas during several hours, thus giving the skin a minimum and the tumor a maximum radiation. In skilled hands no irritation whatever of the skin results.

The immediate effects of the treatment are nausea for about twenty-four hours, some abdominal tenderness, and possibly a leucorrheal discharge for a few weeks or longer. There may be no menstrual period after the treatment, or there may be one or several before amenorrhea is established. Sometimes a second or even a third treatment is required to bring this about.

In younger patients there may be a return of menstruation in a year or two; it is then scant or nearly normal. In some of these cases mild treatment is given with the purpose of controlling and not stopping menstruation.

From the cases given above, Kelly feels justified in concluding that radium is the treatment of choice in uncomplicated fibroid tumors of the uterus. If in the exceptional case it proves ineffective an operation is no more difficult than before radiation.

AMEBIASIS: ITS RADICAL CURE WITH COMBINED EMETINE AND SALVARSAN PRODUCTS.

To the *California State Journal of Medicine* for May, 1918, GUNN contributes a paper in which he states it would appear from his observations that a radical cure of amebiasis can be effected but rarely with emetine hydrochloride alone, and he thinks this is the consensus of opinion at the present time. From a very limited number of observations the same would seem to be the case with salvarsan and neosalvarsan used alone.

The combined use of emetine hydrochloride and salvarsan, neosalvarsan, or novarsenobenzol may be expected to produce a radical cure in a large proportion of cases if the arsenic compound is injected while the patient is well under the influence of the emetine. The treatment as carried out by this method is far more rapid, less severe, and apparently much more efficacious than with most of the old methods of treatment.

THE RESULTS OF TREATMENT IN PERNICIOUS ANEMIA.

The *Bulletin of the Johns Hopkins Hospital* for May, 1918, contains a long article on this subject in which an effort has been made to analyze the results of treatment in a number of cases from a purely objective point of view. Clinical impressions have been disregarded and no attempt has been made to promote or discredit any particular therapeutic measure. It should be recognized that such statistics lead to only general conclusions which allow of exceptions in individual cases. The results may be summarized as follows:

1. No definite evidence has been found that either transfusion, splenectomy, or elimination of foci of infection prolongs the life of patients suffering from pernicious anemia.

2. Transfusion performed at a time when the patient was not refractory brought on remission in about half the cases, and enabled the blood count to be raised to a higher level than it reaches in cases not so treated.

3. Such artificial plethoras did not increase the duration of the remission, although the patients usually had a sense of well-being while the count was high.

4. At other times the same patients were refractory to transfusion as well as to other methods of treatment.

5. The central nervous system symptoms were as little benefited by transfusion and splenectomy as by other methods of therapy.

6. Transfusions of blood were not "held" better after splenectomy than before.

TOXICITY OF CERTAIN WIDELY USED ANTISEPTICS.

In the *Journal of Experimental Medicine* of May 1, 1918, TAYLOR and AUSTIN record a study of this subject and conclude as follows:

1. The substances injected intraperitoneally into mice and guinea-pigs arranged in the order of their decreasing toxicity are: eucalyptol and brilliant green; mercurophen; mercuric chloride and chloramine-T; dichloramine-T and proflavine; hypochlorite, Dakin's hypochlorite, Javelle water, and magnesium hypochlorite; iodine and phenol.

2. Now that Dakin's bland solvent, chlorcosane, is available as a vehicle for dichloramine-T, eucalyptol should probably be discarded for this purpose because of its much greater toxicity.

3. Inasmuch as experienced surgeons do not approve of the injection of solutions of iodine and phenol into closed cavities, it would seem advisable not to use any of the antiseptics here discussed in this manner as all exhibit a greater toxicity for mice and guinea-pigs than the two chemicals first named.

4. The method of testing toxicity of antiseptics by subcutaneous injection is not satisfactory because exudation and subsequent sloughing reduce the rate of absorption and make uncertain the amount finally absorbed.

PAROXYSMAL TACHYCARDIA.

In the *Lancet* of April 13, 1918, PRICE admits that the results of treatment of this disorder, in the great majority of cases, are very unsatisfactory. It is true that the paroxysm not infrequently ceases when various remedies are applied; thus, bringing up of wind, the act of vomiting, the adoption of a certain posture, pressure upon the vagus—particularly the right—friction of the chest-wall and local applications in the form of an ice-bag, mustard leaves, or warmth to the precordium, may be followed by relief. But it should be remembered that the nature of the disorder is to stop suddenly, and, therefore, the question of *post hoc, proctor hoc* always arises. As far as Price's observations have gone the remedy which offers most encouragement is strophanthin injected intravenously. One dose of 1/100 grain, or two or three doses of 1/250 grain, every two hours, may be administered. Failing this, digitalis should be given by the mouth and pushed to the full physiological action. If there be indications of heart failure, such as dyspnea, cyanosis, or dropsy, these should be treated on general lines.

Between the attacks the general condition, and whatever appears to be the exciting cause of the paroxysms, should receive attention. Any gastrointestinal disorder should always be corrected. Bromides may be tried. In one case—and in one only—in Price's experience, the continuous administration of digitalis proved effective.

CARDIAC SYPHILIS.

In the course of a paper in the *American Journal of the Medical Sciences* for May, 1918, MOORE after discussing somewhat in detail the whole question involved closes by saying that a cure of cardiac syphilis is hardly to be expected under any circumstances, but an amelioration of the symptoms and a prolongation of life in comparative comfort may be expected when proper treatment is instituted early. Even in late cases proper treatment will do much good, but after cardiac decompensation has set in it is unusual for any treatment to do more than slight good, and such cases usually end fatally within a comparatively short time. There were two cases with decompensation under his observation recently. One derived no benefit from any treatment and ended fatally in a short time; the other improved somewhat under rest, digitalis, mercury, and salvarsan, and left the hospital, but was never able to return to work and has again more recently returned to the hospital for further treatment. Brooks and Carroll state that when treatment has been interrupted, as in this instance, and is later resumed again, one rarely gets as prompt and satisfactory a response. This observation is exemplified in this patient.

Treatment of cardiac syphilis should be mainly antisyphilitic and intensive. It should differ but little, if at all, from the treatment of syphilis generally, except in so far as the cardiac involvement may be seen to be affecting the patient. The principal object should be to destroy the spirochetes in the tissues as quickly and as effectively as possible, and therefore antisyphilitic treatment should be pushed to the limit of tolerance. As to specific medication, there can be no cut and dried rules that will apply to all cases. Each case must be treated individually. Mercury by deep injection, preferably one of the soluble salts, and salvarsan intravenously are both to be used. There appears to be but little choice between the old and the new salvarsan, but personally, from a rather limited observation, Moore is inclined to prefer the old. There is some question as to the use of salvarsan in acute endocarditis, but used in small dose often repeated, rather than in full dose, Moore believes it to be safe. The iodides are apparently of no use in the early cases, though possibly help in old lesions. Improvement is prompt, as a rule, in all cases, though of course more marked in early cases, and cardiac decompensation always offers a poor prognosis. In the early cases the patients must avoid cardiac strain until their cardiac symptoms are in abeyance; otherwise cardiac treat-

ment is not indicated. In long-standing cases, when circulatory disturbance is more marked, improvement often takes place promptly under specific treatment alone, but, as a rule, it is almost always advisable also to place these patients under the usual hygienic and therapeutic treatment indicated by the circulatory condition, mainly rest and digitalis.

According to Brooks and Carroll, Anders, and others, treatment should be continued for at least one year after all signs of activity have subsided, and irrespective of a negative or a positive Wassermann, antisyphilitics should be administered from time to time throughout life.

A STUDY OF THE COMPARATIVE NUMBER OF SUCCESSFUL VACCINATIONS BY THE CROSS-SCARIFICATION AND THE INCISION METHODS.

In the *Military Surgeon* for May, 1918, KREMERS makes a report on this subject and reaches the following conclusions:

1. Vaccination as done in the military service must be under the direct control of a medical officer, who should be charged with the proper performance of this work. No departure from the method in any important point should be allowed. The method should be printed on cards so that it is constantly before the personnel on duty where vaccinations are done.

2. When arms are scrubbed, an antiseptic liquid soap and pledgets of sterile absorbent cotton should be used. A hand brush should never be used for scrubbing, as this produces minute abrasions on which vesicles form outside of the line of incision and coalescence of these vesicles leads to the same bad results seen in the scarification method.

3. Only one scratch should be made for each incision. Rescratches are bad.

4. It should be impressed upon all medical personnel that careless attention to the technique of vaccination may lead to serious infections which render the men noneffective for considerable periods.

5. No dressing should be used after vaccination unless the vesicles become broken or infection is present. The gauze dressing acts as an abrasive when the arm is rubbed.

6. Force has investigated the comparative results of vaccinations done with and without the use of antiseptics as advised by Schamberg, Dyer, and others. He concludes that "the course of a primary vaccinia is apparently uninfluenced by treatment with antiseptics."

The method of incision is the only vaccination method which should be used in the military and naval services. It should be the method of choice for all vaccinations.

The cross-scarification method gives a slightly higher percentage of primary "takes" than the incision method and a reduced higher percentage of total "takes" (revaccinations included) in unprotected persons.

In 257 unprotected men 87.1 per cent of total "takes" were secured by the incision method against 92.4 per cent in 225 unprotected men by the cross-scarification method.

The percentage of "takes" secured by the incision method is sufficient when carefully done to prevent epidemics of smallpox.

The slightly higher percentage of "takes" secured by the cross-scarification method is offset by the increased number of infections which follow this method.

Medical officers should be assured of the protection against smallpox afforded by vaccination carefully done by the incision method.

THE PREVENTION OF MEASLES.

In *The Practitioner* for April, 1918, MILNE gives this advice:

Prevention.—Every "contact" and every child that may become exposed to infection should receive ten drops of the best pure eucalyptus oil twice (or, better still, three times) a day, placed on the day shirt (front of chest) on rising, and at midday, and on the night shirt when retiring.

Treatment.—Three points should be noted:

A. Rubbing: Before being allowed to

mix with other children the patient should have his first rubbing. The patient is rubbed all over (scalp included) with the best pure eucalyptus oil, twice a day for the first four days, then once a day for six more days—ten days in all.

B. Swabbing: The throat is to be gently swabbed with ten-per-cent carbolic oil every four hours for three or four days. The swabbing should be carried out right between the fauces, and may be done by means of a mop of cotton or wool on the end of forceps.

C. Gauze Tent: In measles one of the chief sources of infection is, probably, the cough. A bed cradle, or other substitute, is put over the patient's head, and over the cradle is spread a layer of gauze, just thin enough for the patient to see through. The gauze must cover the head and neck and must be sprayed with eucalyptus oil periodically, every four hours. This is continued until the cough ceases, or for ten days.

[We would expect dermatitis from so generous an application of the oil to the skin as is suggested above, but as Milne is in charge of a great number of institutional children his experience would seem to remove this theoretical objection.—Ed.]

BEHAVIOR OF HYPOCHLORATE AND OF CHLORAMINE-T SOLUTION IN CONTACT WITH THE NECROTIC AND NORMAL TISSUES IN VIVO.

Reporting a research on this topic to *The Journal of Experimental Medicine* of May 1, 1918, Austin and Taylor conclude:

1. The fall in chlorine concentration in Dakin's hypochlorite solution is more rapid in contact with necrotic than in contact with normal tissue.

2. The fall in chlorine concentration of chloramine-T solution is very slight when applied to necrotic tissue and is negligible when applied to normal tissue.

3. The action of the hypochlorite solution on tissue results in the separation of particles of necrotic tissue, hair, epithelial scales, coagulated serum, etc., and a gradual digestion of these substances, taking place over a period of at least seventeen hours.

4. The fall in the chlorine concentration of the hypochlorite solution is not complete until the particles are thoroughly dissolved.

5. Chloramine-T solution, 2 per cent, has no erosive effect comparable with that exhibited by the hypochlorite solution.

6. Repeated exposures to the three solutions show the hypochlorite solution to be superior in its cleansing ability on necrotic tissue.

7. The hypochlorite solution is more irritating to normal rabbit skin that chloramine-T solution or the alkaline control solution.

8. Therefore, the irritating effects must be due to the readily available chlorine.

THE HYPERTONIC INFANT: THE CURATIVE ACTION OF ATROPINE ON CERTAIN OF ITS MANIFESTATIONS.

To the *American Journal of Diseases of Children* for May, 1918, Haas contributes certain rather original views as to this type of child. He states that correct therapy shows results in this condition which are unusual in their regularity and in the rapidity with which they occur. Where indigestion exists, this, of course, must be improved by appropriate methods of feeding; as a rule, however, there is no indigestion and no change of diet is necessary.

By the administration of atropine in sufficient doses the entire picture changes in from forty-eight to seventy-two hours; in some cases even in twenty-four hours. The method of administering the atropine is in 1:1000 solution, beginning with 1 drop in each bottle of food and increasing it in forty-eight hours, if there is no improvement, to 2 drops in each bottle, and later to three or four or more drops, if necessary, with an interval of forty-eight hours between change in dosage.

If the diagnosis is correct, it will be found that the atropine controls the frequency of the vomiting. The child begins to sleep very much better and for longer periods;

in its waking moments it is comfortable, and cries less or not at all. The vomiting usually ceases entirely or only occurs at rare intervals. Occasionally, one symptom of those enumerated persists long after the infant is in all other respects normal, and that is usually found to be due to some faulty detail in management. As a rule, one or two drops of atropine at each feeding are enough, although frequently 3 or 4 drops or more are necessary. At intervals the atropine is reduced in amount, then discontinued. If there is no recurrence of symptoms, it is no longer required; if, however, the symptoms return, then the atropine must be resumed until repeated testing has shown it to be no longer necessary. This may require months; in some cases six months.

There have been no ill effects noticed from these large doses of atropine in infants, and it is a striking fact that infants a few months of age are able to take doses of atropine which would cause toxic symptoms in the adult.

If atropine is used early and in sufficient dosage the number of cases of pylorospasm which finally reach the operating table as cases of hypertrophic stenosis will be reduced to an unimportant minimum.

It is not to be supposed that all infants who vomit, or cry, or do not sleep, or are constipated will respond to this treatment. On the contrary, if the cause is elsewhere than in the autonomic nervous system, there will be no result.

How is it possible to make a positive diagnosis? It is not possible to make a positive diagnosis by clinical methods, but one can make a probable diagnosis when the combination of vomiting, insomnia, crying, constipation and, sometimes, subnormal temperature exists in the presence of hypertonicity and in the absence of faulty feeding. Atropine, administered in full dose, will definitely establish the diagnosis.

The maximum dose of atropine used in twenty-four hours was 1/15 grain. The maximum amount administered in a single dose was 1/16 grain, where a mother at the Welfare Station at Lebanon Hospital misunderstood directions and gave a teaspoonful of a 1:1000 solution instead of a drop, to a baby under six months. There were no ill effects.

The earliest symptoms of the physiological effects of atropine in infants are a flushing which gives them the appearance of having fever, which sometimes actually exists, but is usually not high, dilatation of the pupils, and slight puffiness of the lids.

In two institutional infants not belonging to this group, atropine in doses of 1 or 2 drops of 1:1000 solution, after several doses produced hyperpyrexia, abdominal distention, flushing, restlessness, vomiting and diarrhea. This syndrome could be reproduced at will. Atropine in small doses paralyzes the efferent nerve endings which terminate in peripheral ganglia (for example, vagus) and in involuntary muscle. Atropine in large doses paralyzes the secretory fibers of probably all glands, including mucous glands, pancreas, and liver; stops the movement and paralyzes the involuntary muscular fibers of the intestines so that they only contract feebly or not at all when directly irritated. Atropine by virtue of the greater than normal transmission of blood through the tissues increases metabolism and results in an increased elimination of waste products.

[We are not acquainted with any investigations which support the views expressed in the last sentence.—ED.]

THE PUPILARY REACTION IN CHRONIC ALCOHOLISM AND ALCOHOLIC PSYCHOSES.

In the *New York Medical Journal* of April 20, 1918, LEAHY tells us that in his study of thirty-seven cases of chronic alcoholism in twenty the pupilary reaction was normal, in sixteen sluggish and the pupilary range limited, and in one the pupilary reaction was absent. Sixteen cases of delirium tremens were included, in three of which the pupilary reaction was normal, in nine sluggish and limited, and in four absent. Twenty cases of acute hallucinosis were included, eleven of which showed a

normal pupilary reaction, five sluggish and limited, absent in four. Ten cases of Korsakow's disease were included, in one of which the pupils reacted normally, sluggish and limited in five, and absent in four. Two cases of alcoholic confused state were included, in one of which the pupilary reaction was normal. Two cases of pathological intoxication were included, in both of which the pupilary reaction was normal. Leahy might add that in none of the cases cited above were there any evidences of acute alcoholism, but all presented the general physical symptom-complex of chronic alcoholism.

We have then eighty-seven cases, in thirty-eight of which the pupilary reaction was normal, in thirty-six sluggish and limited, and in thirteen absent. These findings Leahy believes are both interesting and important because one so frequently associates the diagnosis of paresis and tabes with a sluggish or absent pupilary reflex; also because alcoholics and persons with alcoholic psychoses present other symptoms, such as a thick, indistinct, slurring speech, particularly in delirium tremens, coarse tremors of the tongue, hands, and facial muscles on the physical side, and on the mental side confused states with defects of memory and orientation. In view of his findings Leahy wishes to impress upon all psychiatrists and neurologists the importance of Wassermann reactions on the blood and spinal fluid and also the gold chloride reaction on the spinal fluid as offering a still further means of correct differentiation.

THE STATUS OF TONSIL OPERATIONS.

The *Boston Medical and Surgical Journal* of April 18, 1918, discusses this ever interesting question for the general practitioner and specialist. It says that in spite of the many modern advantages in medicine very little, if anything, is yet known concerning the functions of the tonsil. Being a ductless gland, it has been thought to be part of the endocrine system, but no connection therewith has been found, and, indeed, removal of these glands seems to have no effect on the organism. There are those who believe the glands to be vestigial in character, not having any function at all, and best removed from the body whether giving symptoms or not. A plausible, though unconfirmed, hypothesis is that these glands act as mechanical barriers to the passage of irritating or infective agents. When it is remembered how often these glands are the seat of numerous infections, this hypothesis receives added weight. The tonsils are considered to be the portals of entry for many specific infections, but particularly of the infections causing rheumatism and endocardial conditions.

Tonsil operations have been carried out for a long time, but heretofore they have been very lightly undertaken. Practically no line was drawn between cases that needed removal and those that did not. Yet it goes without saying that unless a tonsil is so large that it obstructs the passage or is the frequent seat of inflammations, surgical interference is not justified, at least until more is known concerning the function of this gland. Moreover, tonsil operations are no longer undertaken by the unskilled. These operations have had a remarkable metamorphosis from minor to major surgical operations. This has in a measure been the natural outgrowth from the reports of increasing fatalities from those supposedly minor operations. The clinic, or even the home, is no longer considered a fit place for this operation any more than for other surgical operations of admittedly major significance. The operation must be surrounded by all the safeguards that a hospital can afford if bad results would be reduced to a minimum. Besides, American surgeons are in favor of doing all these operations under anesthesia. Local anesthesia, however, should be consistently removed from the list of available anesthetics for tonsil operations because there is no means of knowing the amount and the rapidity of absorption of the cocaine, and because of the danger of subsequent severe hemorrhage. Cocaine is a particularly treacherous drug, having caused many fatalities, and without any warnings of dan-

ger. Neither is chloroform favored as a general anesthetic in these operations, also because it is very treacherous in its action, and there does not seem to be sufficient justification for subjecting a patient to this special danger for an operation not of vital necessity. It seems that the ideal anesthetic for tonsil operations is ether, preceded by nitrous oxide.

The mere cutting off of the redundant tissue from the tonsil—tonsillotomy—is no longer in favor. It is considered very poor surgery. Recurrences are usual. This procedure merely exposes a large surface to infection, and for a time at least, until healing, causes an increase of the very conditions that the operation is intended to obviate. If this operation is decided upon as necessary, then the only procedure of choice is complete removal, enucleation—tonsillectomy. The gland should be dissected out, preferably with a blunt instrument, and hemorrhage controlled as in any surgical operation. Styptic drugs or like measures are neither necessary nor advisable. Carried out from this standpoint, tonsil operations need cause little fear of untoward results.

INVESTIGATIONS ON THE COMPOSITION OF OIL OF CHENOPODIUM AND THE ANTHELMINTIC VALUE OF SOME OF ITS COMPONENTS.

To the *Journal of Pharmacology and Experimental Therapeutics* for April, 1918, HALL and HAMILTON contribute a report on this subject. They believe that their experiments appear to warrant the following conclusions: That oil of chenopodium as ordinarily marketed is a very potent and valuable anthelmintic, but it not infrequently acts as a gastrointestinal irritant, a fact that seems to have been commonly overlooked, disregarded, or allowed to go unstated, although noted years ago by Brüning and of late years by Salant and Nelson; that the gastrointestinal irritation seems to be due to constituents making up a fourth, or less, of the volume of the oil and constituting the undistilled fraction when the lighter boiling constituents are distilled over a temperature up to 125° C. with a pressure equal to 30 mm. of mercury, or at equivalent temperature and pressures; and that the use of the lighter fraction as an anthelmintic in preference to the entire oil, in order to protect the patient from gastrointestinal irritation, is apparently indicated. It will be of considerable interest to obtain clinical data in regard to the therapeutic value of this light fraction, for if their findings are confirmed, the use of the refined product would be distinctly indicated, in spite of the extra expense due to distillation and to discarding part of the oil, as the protection of the patient in the administration of anthelmintics constitutes as large a part of the physician's task as the securing of worm removal. Prolonged experience with potent anthelmintics inclines one to attach adequate importance to the dangers associated with these drugs.

Schimmel & Company stated, without giving any reason or proof for the statement, that ascaridol, which apparently corresponds to the heavier fraction of oil of chenopodium, is the part responsible for the therapeutic activity of the drug, a statement which has been generally accepted. Hall and Hamilton's experiments indicate that this constituent is anthelmintic and also a gastrointestinal irritant, while the lighter portion of the oil is apparently even more anthelmintic and much less irritating. It is also worthy of note, in this connection, that Salant and Nelson found ascaridol 30 per cent more toxic than oil of chenopodium, an additional reason for using the lighter fraction of the oil.

PNEUMONIA AT BASE HOSPITALS.

COLE and MCCALLUM in the *Journal of the American Medical Association* of April 20, 1918, make a report of their studies of pneumonia in the U. S. Army. In the army camps represented measles has been prevalent. Pneumonia occurred frequently, but not always as a sequel to measles. The nature of measles is unknown, and they have had no opportunity to learn what

anatomic changes measles alone can produce, but it does produce coryza, conjunctivitis, and laryngitis, and these conditions appear to predispose to infection of the respiratory tract with bacteria. This predisposition is made evident by the greater proportion of the cases of the series in which streptococcus infection followed measles; but it is evident that streptococcus infection may occur in a person who has not had measles, and it is quite probable that other diseases, such as scarlet fever, predispose to its entrance in the same way as measles. When *S. hæmolyticus* gained a foothold, it usually caused in this series of cases the anatomic complex called here "interstitial bronchopneumonia." This is the same whether it is preceded by measles or scarlet fever, or other disease, and its characters are due to the specific effects of the streptococcus. When lobar pneumonia followed measles, the pneumococcus was in this series accompanied by the streptococcus, and in some cases the lobar pneumonia was complicated, anatomically, by the corresponding bronchopneumonia.

Infection with the hemolytic streptococcus does not always cause an interstitial bronchopneumonia, but may produce a patchy lobular pneumonia.

One of the most interesting features of Cole and McCallum's study of the cases is the recognition of the invariable connection of *S. hæmolyticus* with that characteristic anatomical lesion which was well known, but to which they have for convenience given the name "interstitial bronchopneumonia." This lesion is easily recognized in all its stages by its gross appearance, since the prominent, gray, solid peribronchial nodules with surrounding edema, hemorrhage, organization and induration bear no resemblance to areas of pneumonic consolidation, which are homogeneous, solid patches, on the cut surface of which a plug of exudate projects from each alveolus. The microscopic appearance, as described above, is equally specific and characteristic, and there is no possibility of confusion with lobar or lobular pneumonia.

Empyema is a practically constant accompaniment of this condition, and is of extremely serious import.

The organism does not seem to be very virulent, and there is little tendency for it to enter the blood stream or to produce complicating lesions in distant organs.

Lobar pneumonia due to the pneumococcus has been found in many cases, not especially related to the occurrence of measles, but often complicated by secondary or coincident infection with *S. hæmolyticus*. Its characters are exactly as seen above.

[These facts probably explain the different results given by identical plans of treatment, in many instances.—ED.]

PROPHYLAXIS OF PNEUMOCOCCIC INFECTION.

The *British Medical Journal* of March 23, 1918, discusses this subject and points out that the black races are peculiarly susceptible to pneumococcic infection; among the natives of Madagascar and Senegal and the Annamites virulent septicemia with invasion of the serous membrane is prone to occur, and this tendency is aggravated when these natives are exposed to unusual conditions of cold. Jouin has been impressed, from his experience at the colonial laborers' camp at Toulon, by the frequency of sudden death among these natives during the first few days of frank pneumonia; the heart was free from any murmur, but the pulse was rapid, and the systolic blood-pressure often below 100 mm. Hg. In these cases the myocardium was degenerated, pericarditis and early pneumonia were present; death was ascribed to a toxic neuritis of the cardiac nerves, against which cardiac tonics and adrenalin are recommended. In the camps at St. Raphael and Frejus the same tendency to septicemia was shown, and among 52 cases of acute meningitis Baujean reports 22 due to primary pneumoccoccic infection—that is, not secondary to pneumonia; all ran a rapidly fatal course, were remarkably free from vomiting, and often showed pus in the accessory nasal sinuses; the cases occurred sporadically and not in an epidemic

form. He also describes six interesting cases of pneumococcic infection of the skin, four being on the face and suggesting erysipelas, with edema and great swelling. Small bullæ then appeared in successive crops and desquamation was sometimes followed by small yellow abscesses crammed with pneumococci.

In order to protect natives sent to France in labor contingents, the South African Institute for Medical Research provided a prophylactic vaccine, and the results of this immunization appear to have been very satisfactory, although as yet official figures are not available. This was but a small part of the extensive work carried out by F. S. Lister, under the South African Institute for Medical Research, on the immunization of man against pneumococcic infection, and especially of the native mine laborers against lobar pneumonia. In America Douchez and Gillespie, in 1913, established four main types of pneumococci, and shortly afterward Lister began to isolate the groups in South Africa, and now refers to about a dozen, of which "A," "B" and "C" are responsible for 69 per cent of cases of pneumonia there. It is interesting to note that group "A," which is the predominant pneumococcus in the Transvaal natives, is not represented in America, and that groups "B" and "C" correspond to American types II and I, which are the most important in the etiology of lobar pneumonia. A prophylactic vaccine of groups "A," "B" and "C" was given to a large number of native mine laborers with most encouraging results; in the Crown mines the natives thus inoculated became absolutely immune to pneumonia due to these groups of pneumococci, though pneumonia due to these groups was prevalent among uninoculated natives in other mines. But 82 cases of pneumonia occurred in the Crown mines among the inoculated natives; they were due to groups of pneumococci mainly "E," "H," "J," "K," which are therefore probably of sufficient epidemiological importance to warrant their inclusion in a more comprehensive vaccine for future use. These observations are obviously not only of scientific interest, but of great economic importance. Apparently the results have met with some hostile criticism, and the suggestion has been made that the fall in the incidence of pneumonia among the inoculated natives is only part of the admitted decrease of pneumonia due to general causes.

Though these criticisms have only come to our notice in Lister's controversion of their validity, it certainly appears that he has a very strong case, and in any event his labors deserve sympathetic attention. After resorting in 1912 to Sir Almroth Wright's inoculation against pneumonia in the Rand mine laborers there was a remarkable fall in the mortality from pneumonia, and at that time the pneumococcus had not been classified into distinct groups, and it is therefore impossible to say what groups were prevalent in the pneumonia or were represented in the vaccine. Lister's work, therefore, constitutes what promises to be an advance in the practical and scientific application of vaccine therapy. It would be interesting to know what strains of pneumococci are responsible for pneumonia in this country, and how future specific protection by vaccine or curative treatment by antipneumococcic vaccine will compare with the results in South Africa and America respectively.

SARCOMA OF SHOULDER SUCCESSFULLY TREATED BY RADIUM.

In the *New Zealand Medical Journal* for February, 1918, CAMERON makes the following interesting report:

J. W. M., sent with a diagnosis of inoperable sarcoma, right shoulder region, and a request to administer a large dose of radium.

On October 7, 1913, applied the two radium applicators so as to get a crossfire effect toward the center of the tumor for twelve hours, the rays from each applicator being filtered through thin rubber, one sheet tea lead, six sheets of black paper, and a layer of lint.

The applicators are each of 500,000 activ-

ity, containing 10 mg. radium bromide in the one case, radium bromide transformed into the sulphate in the other, the former being in an ebonite box with mica window, the latter a varnish apparatus.

J. W. M. was asked to report again in five weeks' time, but Cameron did not see him again till July 5, 1915.

On this date he told Cameron that the mass commenced to subside eight days after treatment, and that it had completely disappeared in six weeks. He has been working hard and feels thoroughly well.

On examination there was no trace of the tumor and no difference from a normal chest could be detected.

In the axilla there was still a small gland about the size of a little finger-nail and soft.

Cameron is of opinion that the disappearance of the tumor was due to the radium application, and this is in accordance with the experience of others as expressed in the latest report of the Radium Institute: "The result in cases of sarcoma if treated before dissemination into the internal viscera was usually good," and "The response of lymphosarcoma was very remarkable, the growths commencing to shrink within a few days of the termination of the treatment and rapidly disappearing."

THE BAD HABIT OF VAGINAL DOUCHING.

In the *British Medical Journal* of April 20, 1918, FOTHERGILL writes a very practical article on this topic. He asserts that douching does actual harm in more ways than one: for it washes away the normal acid secretion; it kills the acid-producing bacteria, which are the normal inhabitants of the vagina; it kills the superficial layers of cells, and irritates the subjacent layers. Further, it promotes hyperemia of the parts, and thus increases the quantity of the secretion, favors menorrhagia, congestive dysmenorrhea, and intermenstrual congestive pain. This explains the fact that the woman who douches much never gets rid of her vaginal discharge, and generally has other complaints in addition.

The above remarks refer to chronic douching; are there any excuses for what might be called acute or subacute douching? Take septic infection of the uterine cavity after abortion or labor. In these cases vaginal douching clearly does not touch the spot at all, and intrauterine douching is positively dangerous, as it sometimes causes fatal peritonitis by forcing septic material and noxious antiseptics through the tubes into the peritoneal cavity. The proper way to treat uterine sepsis is to dry-clean the uterine cavity thoroughly, using a general anesthetic if necessary; to apply concentrated antiseptics with no excess of fluid; and thereafter to leave the uterus and vagina severely alone. Take gonorrheal infection of the vulva: it is treated by douching; the infection is very likely to be carried up through the vagina to the cervix, whence the gonococcus has a clear run over the mucous lining of both uterus and tubes. Again, when the cervical canal is once infected, douching is futile, and proper disinfection under anesthesia is the only method likely to be effective. In fact, there is no "home treatment" for uterine gonorrhea in women. Yet there are still some who supply their patients with the inevitable douche-can and order copious and frequent libations of Condy's fluid, while in one clinic women are actually advised to wash out their own bladders!

Though it appears that antiseptic and medicated douches might well be dispensed with altogether, there are exceptions to the rule. Thus, in the palliative treatment of cancer of the uterus, disinfectant and deodorant solutions must be used. Again, when preparing a prolapsed and ulcerated vagina or cervix for operation, the nurse will give one or two mildly antiseptic douches every day for a week or ten days, during which time the patient is kept in bed and the vagina lightly packed. After vaginal operations also, a few antiseptic douches are useful on those rare occasions in which the incisions become septic. In such cases the indication is definite. But often there is no indication at all. The patient says, "Doctor, I have a vaginal discharge." The

doctor makes no examination, but says, "Get a douche-can," and orders alum, iodine, lysol, mercuric chloride, boracic acid, zinc sulphate—anything, in short, that occurs to him. The patient begins douching, the doctor forgets to stop her, and she goes on with it for years. The idea that a vaginal discharge must be infective is very wide-spread and persistent, though it may be far from correct. When a woman complains of a discharge it is most frequently "the whites," namely, excess of the normal creamy vaginal discharge. This is commonly before and after menstrual periods in perfectly healthy persons. Its persistence throughout the intermenstrual period is often an expression of low general condition; but some women have more vaginal secretion than enough throughout life, and quite apart from variations in health. Any form of local treatment aggravates "the whites," but the condition often disappears with improvement in health brought about either by general treatment or by change of air and scene. When the vaginal discharge is slimy, the uterus is secreting too much mucus, and this is increased by douching or any other local treatment of the vagina. If any local treatment is required it is curettage of the uterus; but this generally fails unless the general muscular and vascular tone is improved at the same time.

Hot douching is often ordered in cases of menorrhagia and other kinds of uterine bleeding. It is true that the application of water at a temperature of about 120° F. contracts the blood-vessels and leaves them in a state of contraction which lasts for from half to three-quarters of an hour. But water which is hot enough to produce this effect is uncomfortably hot for the skin round the vulva and anus as it flows out of the vagina. It is possible, given a strong-minded nurse and a weak-minded patient, that really hot douches may sometimes be given for several days together. But in practice, when the hot douche is ordered, it is given warm; and water at 100° F. increases pelvic hyperemia and so increases uterine bleeding. Thus it happens that when hot douching is ordered for menorrhagia, the patient really receives treatment by warm douching, and the bleeding gets worse instead of better. The hot douche, therefore, should probably be kept for use in obstetric hemorrhage, in which it is doubtless very useful on occasions.

Under certain circumstances it is highly desirable to increase pelvic hyperemia, and for this purpose the prolonged warm douche is useful if given under proper supervision and for a limited time. The typical case for this treatment is a patient who is recovering from pelvic cellulitis following infection of a torn cervix. There is a more or less massive deposit of inflammatory exudate in the pelvic cellular tissue. Its absorption must be favored in order to avoid permanent fixation of the pelvic organs. The same holds true also in reference to inflammatory deposits in other pelvic tissues and organs. Thus, in the subacute phases of pelvic infection, vaginal douching is seen at its best. A slow stream of normal saline solution at a temperature of 100° F. to, say, 105° F., kept up for ten or twelve minutes once or twice a day for two or three weeks, forms a part of the proper treatment of these cases. But it must be done with the patient lying on her back, for when a douche is given with the patient sitting up the flow of water never separates the vaginal walls, but simply runs out beside the douche nozzle without even washing the vaginal surface. To act as a poultice or fomentation the water must balloon the vagina, and this it does only when the patient is on her back.

It may have been noticed that some people cannot learn at all, that some can learn only by their own experience, and that some are sufficiently astute to profit by the experience of others. To those who care to try the results of Fothergill's experience he offers the following practical hints:

1. Do not allow patients to douche themselves at all; but, when you have a definite reason for douching, let a nurse do it.

2. Do not use antiseptic douches unless there are germs to be killed in the vagina.

3. Remember that vulvitis is common but vaginitis is rare.

4. When you wish to apply antiseptic lotions to the vulva tell the patient not to douche herself with the lotion but to put it in a large bowl and sit in it.

5. Do not order hot douches (120° F.) in cases of menorrhagia and metrorrhagia.

6. Do not douche for leucorrhea either creamy or slimy.

7. Do not douche for aches and pains in the pelvis which are not due to pelvic infection.

8. Use warm douches (100° F.) as you would use poultices or hot fomentations, in cases of pelvic infection which are neither too acute nor too chronic to be improved by the production of temporary local hyperemia.

ANTITETANIC SERUM, CLINICAL AND EXPERIMENTAL.

The *Lancet* of April 20, 1918, tells us that it has received from Surgeon-General Sir David Bruce a sixth analysis of 100 cases of tetanus treated in home military hospitals, covering the period from March to June last year. The mortality of these cases was 29 per cent and the incubation period 44 days, being practically the same as the average for the previous 400, and a consideration of this fact leads Sir David Bruce to remark that little more can be expected from the use of prophylactic and therapeutic antitetanic serum: it is now, he says, up to the surgeon to do the rest. He reminds surgeons again that when operations are performed at the site of wounds, even if these are already healed, a prophylactic injection should always be given. In regard to the route of administration in acute general tetanus, the Tetanus Committee were of the opinion that the intrathecal route afforded the greatest chance of recovery, and Sir David Bruce contrasts this advice, coinciding as it does with experimental evidence, with the increasing popularity among surgeons of the intramuscular route.

It appears, however, that the work of the bacteriologist is not yet to be regarded as complete, for the results are just to hand in the *Journal of the Royal Army Medical Corps* of an elaborate inquiry into wound infections in cases of tetanus by Captain W. J. Tulloch, R.A.M.C., based on work done at the laboratories of the Royal Army Medical College and the Lister Institute of Preventive Medicine. The main object of the inquiry was to determine whether the tetanus bacillus can fairly be regarded as an individual organism, or whether there is a group of allied bacilli any of which may give rise to spasm-producing substance, toxic for man and animals. Preliminary investigations led to the discovery of a selective culture medium adapted to the enrichment of *B. tetani* against the other organisms frequently accompanying it, and incidentally to the part played by symbiosis in the pathogeny of anaerobic infection. The preparation of this important medium is described thus:

Take 1 pound of chopped meat, add 1 liter of water, boil 30 minutes, cool to 45° C., adjust reaction of fluid so that it is slightly alkaline to litmus. Trypsinize as for Douglas's broth; incubate in open vessel for five days at 37° C. Filter products of putrefaction through paper, add sodium formate 1 per cent of total, adjust reaction of fluid to neutral point for phenolphthalein. Fluid is then filtered through a Berkefeld and Doulton filter in series, stored under paraffin in sterile flask mounted with hooded delivery pipette, so that medium may be distributed into tubes. Before use each tube of 10 Cc. is enriched by addition of ⅛ part of fresh rabbit kidney, removed (after killing animal) by sterile operation. Author usually employs tubes containing 5 Cc. of medium and adds 1/16 part of kidney to each. To insure sterility, 5, 1, 0.5, 0.1, and 0.01 Cc. are inoculated into meat tubes which are incubated anaerobically for 14 days and should show no evidence of growth.

The conclusions which Captain Tulloch with proper reserve allows himself to make are: The frequent presence in the wound exudates of tetanus patients of non-pathogenic bacilli liable to be mistaken for the true tetanus bacillus; their presence indi-

cates a condition of the wound in which the tetanus bacillus, if it gains access, grows readily. He has satisfied himself further that there are at least three serological types of the *B. tetani* itself, and that in cases of tetanus among the wounded in England the causative bacilli do not correspond serologically with the type commonly employed at the present time for the preparation of antitoxin. There appears, therefore, to be further work for the bacteriologist.

NITROUS OXIDE ANALGESIA IN OBSTETRICS.

In the *Chicago Medical Recorder* for May, 1918, HOAG writes on this topic. His confession of faith in obstetric analgesia is about as follows:

He believes we have allowed our patients in the past to suffer unnecessarily and that in the future we can conduct labor cases with skill and judgment, by the use of morphine (and chloral if we choose) early in labor and nitrous oxide with a little oxygen later on, employing in some cases a modicum of ether when we have operative work to do. He believes prolonged gas analgesia, say for six or eight hours, is perfectly safe for healthy patients, if properly managed. He believes gas does not prolong labor, but tends to shorten it, and does not lead to physical depression and postpartum hemorrhage. As a corollary to the last proposition, it may be stated that the prolonged use of chloroform and ether is distinctly dangerous. He disagrees with those who say that the technique of gas analgesia is so simple that it readily may be entrusted to a nurse or a member of the patient's family. Such a procedure may not be dangerous, but it is unproductive of good results. The proper technique can only be learned by very considerable experience, the best results being only obtainable by experts. He believes that obstetric analgesia is more difficult than surgical anesthesia with gas, and thinks that in hospital obstetrics gas should be given in most cases, but only by experts, just as now obtains in the operating-room for general surgical cases. Most of all we should have experts when we care for obstetrical patients in their homes. He believes most women who had had gas administered to them have experienced some relief, but not what was their due. He thinks that very little oxygen is required and that all along we have been using too much of it. In obstetric analgesia the rebreathing bag makes only for a small economy and is in some respects objectionable, and there is little or no danger of asphyxia to the child. If it is born asphyxiated, the condition can be relieved by giving oxygen through the mother to the child by the simple expedient of leaving the funis untied until oxygen has been administered freely to the parturient mother.

In concluding this part of his subject, Hoag wishes to point out that interns who make only occasional use of the gas are not satisfactory anesthetists and that they are, through their unfamiliarity with the proper use of the gas, very wasteful of it, being mainly responsible in hospitals for the complaints we hear regarding the cost, which is not great under proper control.

Hoag was surprised to learn recently that in one of our best hospitals obstetric analgesia was considered largely a joke, consisting, as he was informed, of the administration of a few whiffs of oxygen with slight admixture of nitrous oxide, begun shortly before the end of the second stage of labor, actual delivery being under ether or chloroform. Hoag considers himself fortunate that in his first experience he had a good operator at the machine, and he would advise all who mean to use this great boon to start out right by witnessing a properly conducted case in order to possess a criterion with which to compare their subsequent experiences in gas analgesia.

As for the dammerschlaf, Hoag does not feel it necessary to say much. The American public was misguided by unofficial reports which emanated from the laity. The dammerschlaf never had much vogue in Germany except in one small hospital. The plan of conducting labor under the influence of scopolamine and morphine was not with-

out value, as it produced excellent results in some cases. Among its objections are these: It requires unusual surroundings, including quiet, exclusion of friends and shutting out of light; it involves unusual attention on the part of physicians and nurses, in the way of regulation of doses and in the direction of preventing the patients from doing themselves injury, as they are apt to become hysterical or even maniacal; it appears to prolong labor and to endanger the life of the child; it is largely an illogical procedure, in that it depends for its results not upon anesthesia or analgesia, but upon amnesia; complete amnesia having been produced, if the patient merely became for the time being a maniac, tearing her hair, shrieking, running about and trying to jump out of the window, but at the finish gave birth to a healthy child and survived, the case was considered a brilliant success, provided the patient retained no recollection of what had transpired.

A PHARMACOLOGICAL AND THERAPEUTIC STUDY OF BENZYL ALCOHOL AS A LOCAL ANESTHETIC.

Reporting his studies in the *Journal of Pharmacology and Experimental Therapeutics* for April, 1918, MACHT reaches these conclusions:

1. Laboratory experiments with benzyl alcohol or phen-methylol show that it possesses powerful local anesthetic properties, on the one hand, and a very low toxicity as compared with other well-known local anesthetics on the other.

2. A series of clinical cases in which weak solutions of phen-methylol were administered as local anesthetics for the performance of surgical operations proved that the drug is an efficient local anesthetic also in practical surgery.

3. It is considered that the anesthetic efficiency, the low toxicity, the simple excretion of the drug by the organism, and the ease with which benzyl alcohol solutions can be sterilized, will render it a useful therapeutic agent in medicine and surgery.

THE VALUE OF AMYL NITRITE INHALATIONS IN THE DIAGNOSIS OF MITRAL STENOSIS.

In the *British Medical Journal* of April 20, 1918, MORISON reminds us of the fact that mitral stenosis develops insidiously and symptoms of a really incapacitating nature are frequently absent until the lesion is well advanced. In soldiers it is often discovered accidentally during the routine examination of a man reporting sick for a trivial complaint. In young soldiers, when very early and uncomplicated, it is unaccompanied by subjective symptoms which are characteristic. The number of border-line cases appears to be remarkable, until it is remembered that the strains to which the men are subjected are precisely those calculated to call forth symptoms in early cases. Advanced mitral stenosis has been largely kept out or sorted out of the army, and patients who suffer from "irritable heart" in the absence of structural change very frequently present such signs as accentuation of the first heart sound, accentuation or reduplication of the second heart sound, signs which are credited with significance in the early diagnosis of mitral stenosis. In dealing with military patients a clear decision is most desirable; it is imperative when, in sorting cases bearing cardiovascular diagnosis, tolerance of exercise is largely relied upon. Men with structural heart disease are to be guarded against overexertion. We may take a diastolic (presystolic) rumble or thrill, or both, to be the most positive and convincing sign of mitral stenosis, and it is at present inadvisable to diagnose this lesion in the absence of such a murmur. Any method, therefore, which accentuates such a murmur, or discovers it, must be of considerable value.

Amongst patients who fall near the diagnostic border-line (a border-line which it should be clearly understood varies according to the skill, experience, and opinion of the observer) there are a number of patients who present no suggestion of mitral stenosis when they are examined standing, but who present unequivocal signs while lying down; there are a number who pre-

sent inconclusive signs of stenosis while standing, but signs of stenosis become clear on lying; still a further number who exhibit no conclusive signs standing or lying, but in whom the diagnosis is no longer in doubt while they lie after exercise. At the Military Heart Hospital at Colchester all cases are auscultated standing and lying, and lying after exercise, and a considerable number of presystolic murmurs are detected which would otherwise escape observation.

Amyl nitrite is used as a further test in doubtful cases; its action, like that of exercise, is to increase the flow of blood through the A-V ring, a change which favors the production of the murmurs in question. Morison desires to give his early impressions and experience of amyl nitrite. The observations are not based upon post-mortem evidence, but upon the assumption that a clear presystolic murmur signifies stenosis in the absence of aortic disease. On that assumption it is clear to us that amyl nitrite will often bring to light a clear presystolic or full diastolic murmur in a patient lying on his back, who had exhibited no murmur previously, and will thereby render an early mitral stenosis diagnosable.

In twelve cases in which presystolic murmurs were suspected, but in which they could not be recognized with any degree of certainty, amyl nitrite (inhaled from a 3-minim capsule until a reaction was evident) brought forth unmistakable murmurs in six instances. Amongst the first signs of early mitral stenosis is an accentuated first sound; from this sign the sounds pass to a simple reduplication with accentuation, to perhaps a triplication, and thence to what may or may not be termed a murmur, according to the idiosyncrasies of the examiner.

The point which is to be emphasized is that amyl nitrite, in a large proportion of cases, will raise the scale of the signs, bringing them nearer to a point where a diagnosis becomes clear.

As to the cases in which amyl nitrite has the reverse effect, and produces a lowering of the scale, in some cases abolishing a diastolic murmur, Morison speaks with more diffidence, yet it is extremely suggestive that this reversal of the usual effect has been witnessed for the most part in cases in which aortic regurgitation was undoubtedly present, and where consequently the murmur may have owed its origin to a different cause (Flint murmur). Whether it will prove ultimately that the test serves to differentiate the Flint murmur remains for the future to decide; so far as military diagnosis is concerned, it is a point of lesser importance; the point for which publicity is desired is the usefulness of the drug in bringing out clear presystolic murmurs in cases in which mitral stenosis is suspected but not proved.

ABORTION AND ITS TREATMENT.

In the *New York State Journal of Medicine* of May 21, 1918, RONGY states that during the past six years, six hundred cases of simple, uncomplicated, incomplete abortion were admitted to the gynecological service of Lebanon Hospital. The plan of treatment usually followed in these cases was very simple. Curettage was only resorted to when the bleeding was excessive. This was almost always accomplished by a placental forceps or dull curette. A sharp curette is never used. A hot normal salt intrauterine irrigation completed the operation. Packing of the uterus with gauze is but seldom resorted to. General anesthesia was not administered unless absolutely necessary. The average stay of the patients in the hospital was eight and one-quarter days.

The largest number had a rise in temperature during the first three days in the hospital. It usually subsided on the fourth or fifth day. No patient was discharged from the hospital unless the temperature was normal for at least two days.

During the past three years many cases of bleeding were controlled by the use of pituitrin. Rongy believes many a patient was spared the ordeal of a curettage by the judicious use of this drug.

In cases in which the product of conception is separated but still retained in the uterus and is not expelled, Rongy always

administers pituitrin preliminary to its removal. The body of the uterus contracts and becomes firm. The contraction of the uterine wall will complete the separation of the retained material, and it will also push it down into the lower portion of the uterine cavity. The muscular contraction will shut the mouths of the blood-vessels, and the danger of hemorrhage is greatly minimized. Pituitrin, by causing contraction of the uterine walls, will in many instances obviate the danger of perforation of the uterus. Cases which show signs of an inflammatory reaction in and about the uterus are rigidly left alone. Every possible manipulation is eliminated. Rongy always felt that in such patients he was likely to convert a local infection into a general systemic infection by disturbing the protective membrane which has already formed within the uterine cavity. Instrumentation in such cases may create a new wound area which may act as a point of entrance for the bacteria into the general circulation. Pituitrin ½ Cc. every four hours hypodermically is administered for about two or three days subsequent to any intrauterine manipulation.

This briefly summarizes the management of cases of uncomplicated abortion. Rongy feels that the general routine carried out by the largest percentage of family physicians, as well as some of the specialists, in the treatment of this condition is entirely unscientific. It very often produces complications which invalids the patient temporarily if not permanently. It is a well-known fact that every patient in private practice who suffers from an incomplete abortion is subjected to some form of curette. The teaching of twenty years ago is still clinging to the general profession. The subject is given too little attention by teachers as well as writers on this very important question. It is usually considered a minor procedure and it is therefore treated as such. If the true principles governing the pathology of this condition were properly understood, the many accidents and complications which very often take place in the course of treatment in the ordinary case of retained products of conception would be obviated. It is appalling to see the many pelvic complications which result from the injudicious treatment of the ordinary case of incomplete abortion. Our hospitals are crowded with patients who suffer from all varieties of pelvic infection as a result of unnecessary intrauterine manipulation.

THE TREATMENT OF INFECTED, ESPECIALLY WAR, WOUNDS.

Rutherford Morison *(Journal of the Royal Army Medical Corps,* March, 1918) thus summarizes the treatment, which was found extremely efficacious:

Under an anesthetic, usually open ether, cover the wound with gauze wrung out of 1-to-20 carbolic acid, and clean the skin and the surrounding area with the same lotion.

Open the wound freely and, if possible, sufficiently to permit of inspection of its cavity. A guide—a finger is the best if the size of the wound permits of it, and if not, a thick probe—should be introduced to the bottom of the wound and held there and fully exposed. In doing this special regard must be paid to nerve trunks and muscular branches of nerves, since the division of blood-vessels, excepting the largest, and of muscles themselves does little harm as compared with that of the disability following nerve damage. Cleanse the cavity with dry sterile gauze mops, Volkmann's spoon, etc., and remove all foreign bodies.

Mop the surrounding skin and the wound cavity with methylated spirit and dry it.

Fill up the whole wound with bipp, rub it well in with dry gauze. Then remove all excess, leaving only a thin smear covering over the wounded surface. Dress the wound with sterile gauze and cover all with an absorbent pad. This dressing requires no change for days or weeks if the patient is free from pain or constitutional disturbance. Should, however, discharge come through, the stained part must be soaked in spirit and a gauze dressing wrung out of the same applied as a further covering.

Redressing is very simply done. After removal of the old dressings the wound is covered with a dossil of wool soaked in spirit, and the sticky, dirty-looking discharge is wiped off the surrounding skin until it is clean.

Bipp is a mixture made up of one part of bismuth, two parts iodoform, one part paraffin. Morison states that it is now certain that if the entire cavity of an infected wound can be thoroughly cleaned mechanically, then treated with suitable antiseptics, satisfactorily closed with sutures, and suitably dressed, it will heal frequently under a single dressing, and in more chronic cases without serious disturbance. This has been proved by hundreds of cases in the Northumberland War Hospital, and in the practice of surgeons who have communicated their results to Morison. The latest convoys from France show that this method is now widely known, as more than half of the patients bring a card with them stating that they have been bipped. If the difference between these cases and those treated by other methods could be seen by military surgeons, there would soon be no other means used until something better had been demonstrated.

Captain Anderson, R.A.M.C., speaking at a medical conference at Malta, said: "By the general and systematic use of bipp the work of the surgical branch of the Royal Army Medical Corps could be reduced by at least two-thirds." In addition to this lives and limbs have been saved which would have been lost by any other method, suffering has been averted, expense diminished, and recovery hastened.

Objections have been noted, such as iodoform or bismuth poisoning, that bipp interferes with *x*-ray examination after its application, and that bacteriological proofs of its efficiency are lacking; but the author is convinced that these objections, important though they may be, should not be allowed to weigh against clinical evidence so definitely in favor of this method in times of such urgency. A study of means to overcome them should be the chief consideration.

NITROUS OXIDE ANESTHESIA.

Florence E. Thompson *(Chicago Medical Recorder,* March, 1918) states a good preparation for patients to have preceding the operation is a cathartic and an enema in the evening, also a sedative so they may sleep well, and an enema in the morning. Body well filled with liquids and enough sodium bicarbonate given to render the urine alkaline. The amount of ether necessary for relaxation may be greatly reduced by giving 1/6 of morphine and 1/200 scopolamine.

There are twenty-seven different kinds of gas machines on the market; there are two distinct types, one with the N_2O and O bags and a rebreathing bag; the other simply the rebreathing bag. The author has used both types and does not see much difference. We can get good results with any low-pressure machine, providing we know the mechanism.

The inhaler should be very gently adjusted over the mouth and nose. If it causes any disturbance the patient should be allowed to breathe air through the mask until he becomes accustomed to it; then turn on the N_2O with the rebreathing valve closed, and continue in this manner until you see signs of cyanosis; then add sufficient amount of O to produce normal color (about 10 per cent). The amount will vary with the different stages of the operation, patients, and surgeons.

Dr. Teter says the following is necessary to obtain N_2O-O-ether anesthesia:

Use of preanesthetic narcotic.

Use of pure O.

Definite and even flow of gases.

Rebreathing the gases.

Positive intrapulmonary pressure.

Warming of the gases, and, the author adds, ether. Ether for stimulation and relaxation. It is important not to be held down by cut and dried rule.

Perhaps the expense has been responsible for the slow progress of the use of N_2O as an anesthetic. The author states that it costs when given properly 80 cents to $1 an hour. He advises against its use

in children under five years of age because of small respiratory passages and because of increased liability to asphyxia symptoms. Nor should it be used in obstructions to the airway, as in case of tumors about the neck, goitre, etc.; nor in arterial sclerosis and heart cases; nor in athletes nor alcoholics. It is subject to the disadvantages of being expensive, often does not bring about complete relaxation, has a narrow margin of safety, and its technique is difficult.

A little ether throughout is advised as a stimulant, even though it is not required for relaxation. The author states that she believes N_2O-O-ether anesthesia is the safest and most efficient form that we have to-day and that she will use it until she finds something better, which she surmises will be $MgSO_4$ injected into the veins. She particularly commends it for the relief of the pains incident to childbirth, but warns that it should never be started unless the anesthetist can remain with the woman throughout the labor, for it will be impossible to get away after the relief has once been given. When the pain approaches the mother is allowed to take a few deep inhalations of gas. At the end of contraction the inhaler is removed and the patient is awake and is resting until more gas is required. This may continue for hours. The author states she has thus given gas to hundreds of patients with the most gratifying results.

SURGICAL TREATMENT FOR THE CURE OF CHRONIC SUPPURATIVE OTITIS MEDIA IN CHILDHOOD.

HORGAN (*British Journal of Children's Diseases,* March, 1918) states that if it be properly understood that the ultimate utility of the chronic suppurating ear of childhood will in a large measure depend upon the resultant disorganization of the conductive apparatus or middle ear, and that the disorganization will depend upon the length of time during which the disease has remained active, it will be readily seen that all efforts at treatment should aim not only at obtaining but still more in maintaining a dry ear.

It must be clearly borne in mind that ear disease of this type in children is in the vast majority of cases secondary to interference with the natural drainage and ventilation, or to continuous reinfection of the middle-ear space, and that any treatment which fails to ascertain and, if present, remove this exciting cause must *ab initio* fail to do more than bring about a very temporary amelioration of the disease. Hence it should be our invariable rule thoroughly to ascertain in the first instance the obstructive or infective agent in the child's nose, pharynx, or mouth, and to effect its removal.

Adenoids, if present in any amount, should be removed. In this respect it is necessary to remember that the disposition and condition of any adenoid mass present are of more importance than its size. A small but septic adenoid mass—aptly compared by Laurens to a septic sponge—when situated anywhere in the nasopharynx, but more especially in the neighborhood of Rosenmüller's fossæ, is a very potent factor in the continual reinfection of the Eustachian tube and middle ear, even though its presence may in no sense interfere with respiration. A failure to diagnose the presence and effect the removal of such small septic foci is a frequent cause of the interrupted continuation of the ear discharge.

If any hypertrophied conditions of the inferior turbinals have been confirmed at the original examination they require reduction, which, if necessary, should constitute the first step of any operation undertaken for the removal of tonsils or adenoids or both. Further, if the child's nose be markedly obstructed on the affected side by a septal spine or deflection, the writer has no hesitation in partially resecting this structure by the submucous method.

The removal of the tonsils is highly desirable in 95 per cent of suppurative ear cases, and it is worthy of mention that the actual size of a child's tonsil is often very difficult to ascertain without palpation, which can, of course, be best carried out on the table.

The removal of the adenoids, though for obvious reasons reserved until the end, is

nevertheless the most important of all surgical measures undertaken for the cure of chronic suppurative ear diseases in children. It is, unfortunately, performed in a haphazard, not to say dangerous, fashion.

The nose, mouth, and pharyx having been rendered as healthy as possible, our attention should then be directed toward the actual conditions prevailing in the middle ear. Polypi, if present, should be removed, and granulations cauterized with chromic or trichloracetic acid.

As regards local treatment, the instillation of warm drops of equal parts of hydrogen peroxide and 70-per-cent alcohol has given the author the best results. The mother should be directed to instil the drops lukewarm, allow them to remain in the ear two or three minutes, dry them out with cotton-wool whilst tilting the head to the affected side, and then to repeat the whole procedure a second or even a third time, immediately. Syringing with a warm alkaline or saline solution is only called for if the discharge is profuse or fetid, conditions which will usually rapidly disappear under treatment. The intervals at which it is required will thus tend to increase from the inception of treatment. Cotton-wool should not be worn in the ear in the absence of profuse discharge, as the drying and healing properties of air and light are of great importance in curing these anaerobic infections. If the ear still fails to respond to treatment, a cure may, in many cases, be obtained by curetting of the isthmus and external end of the Eustachian tube as described by Yankauer.

Finally, in a very small proportion of cases, such as those of scarlatinal or tuberculous origin or in which cholesteatomatous changes are present, an ossiculectomy, or eventually a radical mastoid operation, is called for.

The radical mastoid operation is still performed on children much more frequently than is necessary, and this is due to a failure to understand and remove the underlying causes of the infective and obstructive process.

All who have performed it in any number of cases have experienced the ear that refuses to dry after operation because of a persistently unhealthy Eustachian orifice and tube. In these cases the radical mastoid operation should, in all probability, never have been performed.

In conclusion, it may not be out of place to repeat that, inasmuch as prevention is better than cure, it should be remembered that in almost all cases chronic suppurative ear disease starts as an acute infective process, which, as Woods has so well pointed out and proved in his own practice, may be readily cured with a minimum of injury to the special organ concerned in the space of a few weeks or less by simply treating the primary ear lesion on the same principles of aseptic surgery that are applied to other parts of the body, and thereby insuring that an infection which in the first instance is due to a single microörganism may not by external contamination rapidly become a multiple one.

When it is duly recognized in practice as well as in theory that the chronic suppurating ear of childhood is, in most cases, a direct sequence to the inefficient or faulty treatment of a simple acute middle-ear inflammation, and children are no longer discharged from fever hospitals with their ear lesions still unhealed, then, and only then, will the great number of these cases visiting every ear clinic show any sign of diminishing.

MUSCLE CONTRACTURE FOLLOWING INJURY.

Bruce (*Proceedings of the Royal Society of Medicine,* Volume XI, No. 5) notes that a great many cases of muscle contraction occur among wounded soldiers. Because of this a questionnaire was sent out which has been in part answered by a number of surgeons. For instance, Harris reports a hysteroid flexor spasm; a clonic facial spasm; a facial tic. Swan notes the case of a spastic leg which was treated as chronic tetanus and was transient. Golla states that in regard to contracture, we are dealing with what is a new chapter in the surgical history of wounds. It is very important to be abso-

lutely clear as to what we mean when using what is a very ill-advised term. There is a real and a false kind of contracture, and the real kind is that of nervous origin. It is a constant contraction, without remissions, and it is dependent on the functional continuity of the muscle with the central nervous system. Perhaps the best analogy we have to contracture is the contraction of the adductor muscle in the mollusk, where there is a chronic contraction kept up without work being done and without discharges, as in tetanus proper. Contracture may be of cerebral or of spinal origin, and according to its origin we shall find it differently dealt with when we look at the subject under anesthesia. If the contracture is of cerebral origin, a light degree of anesthesia, sufficient to abolish consciousness, will abolish the contracture. If it is of spinal origin, we shall have to push it to the degree of general muscular relaxation to get rid of the contracture. It is important to define also the contracture of myogenic origin. That may arise as a secondary symptom to nervous contracture—that is to say, if a contracture of nervous origin be kept sufficiently long certain changes in the muscle will occur, and the muscle itself will take on a permanent contraction, one which is independent of the central nervous system.

Among other causes of myogenic contracture are ischemia, such as Volkmann's ischemic contracture, or simple paralysis and secondary contraction, which we may get in a paralyzed facial muscle. Those will not be resolved by chloroform, nor by ablation of the central nervous system; they are of myogenic origin.

Obviously, a great number of the cases are of functional origin. When a wounded man develops, within five minutes of receiving his wound, acute contraction of muscles in the wounded limb, most of us would consider it of this class; and when cases can be resolved by hypnosis, by ordinary suggestion, or by strong faradization, there is no doubt about their origin. But some cases are resistant, and Babinski attempted to establish the discredited theories of reflex contracture, using them to bolster up his former theory of hysteria never showing symptoms which are not under control of the will. That is to say, if a case be functional, the symptoms shown must always be those which can be reproduced by an act of the will. The commonest experience is absolutely against these contentions of Babinski.

When the patient is unconscious he cannot be hysterical, and if a contracture disappears under an anesthetic which has been pushed only to unconsciousness, we can say the contracture is due to consciousness, or is associated with it. But there is one point to be remembered: if hysterical contracture has been allowed to go on for many weeks or months, changes in muscle will have taken place, and an anesthetic, even if pushed to the full, will not abolish the contracture. Therefore the diagnosis should be made within a few days after the beginning of the nervous contraction. If the contracture is only checked when the anesthetic has produced muscular relaxation, the contracture is of neurogenic origin.

Goadby states that the chief symptoms in the diagnosis of local tetanus are:

Clonic spasm (twitching), either of the wounded muscle itself or of those in the vicinity. In the majority of cases the spasm is painful, and follows voluntary movements elsewhere or an attempt to move the affected limb. "Jumping" is the term generally referred to it by the patient, and a wound which "jumps" when it is dressed is common in local tetanus. In three cases in the author's series the "jumping" when the wound was dressed progressed to further symptoms of tetanus, including trismus, but recovery followed. He is convinced that the tetanus toxin affects the muscles themselves, in addition to the nerves.

Besides the patellar reflex in the leg, the elbow reflex in the arm, etc., the reflex tonic contraction lasting for many seconds, sometimes minutes, may be observed on exciting the distal muscle.

All cases of contracture should be treated with intramuscular doses of high potency antitetanic serum. There is practically no danger of anaphylaxis with the quantities of

serum necessary—2 or 3 Cc.—and the improvement of an obstinate case of contracture under the influence of the serum is in favor of the diagnosis of local tetanus.

Another fact which stands out is that tetanus bacilli may lie perdu for months or even years in the depths of wounds, whether healed or unhealed, and that operative interference is apt to light up the smoldering embers. In the last published analysis there were thirteen such cases in which no prophylactic injection was given before the operation. Nine out of the thirteen died.

Not only is there a danger of the tetanus bacilli gaining entrance through unconsidered breaches in the skin, but the intestine itself must be considered in war-time as a danger zone. Living and eating and drinking while smothered in the mud of the trenches must lead to the swallowing of many tetanus spores. It is not to be wondered at then that several cases of operation involving the intestine, such as appendicitis, have been followed by tetanus. Captain Tulloch, a member of the Tetanus Committee, has found the bacilli in the intestinal contents of such cases.

THE IMPORTANCE OF RECOGNIZING THE WEAKNESS OR THE OBLITERATION OF THE CONJOINED TENDON IN OPERATIONS FOR INGUINAL HERNIA.

Bloodgood (*Southern Medical Journal,* Vol. XI, No. 5) observes that the chief cause of recurrence in the lower angle of the wound was the obliteration of the conjoined tendon. This type of hernia was observed in about 5 per cent of the cases, and the failure to cure in this group was almost 50 per cent.

In the ordinary case of inguinal hernia the index-finger as it passes into the external ring is deflected upward and outward following the course of the inguinal canal, and if one requests the patient to raise his head the index-finger easily recognizes the edge of the rectus and the lower border of the internal oblique muscle, and it palpates the solid wall (conjoined tendon) of the posterior inguinal canal bounded below by the pubic bone, above and medial by the internal oblique and rectus, and below by Poupart's ligament. In the larger group of cases the opening is above and to the outer side of this anatomical structure. In cases characterized by weakness or obliteration of the conjoined tendon the index-finger easily passes through each external ring into the pubic cavity and palpates the pubic bone. In treating a case of this kind a triangular flap is outlined with the undivided base along the edge of the rectus. In the case reported the sheath was so attenuated that it made a very inadequate flap. The rectus muscle was mobilized by blunt dissection and division of some of its fibers.

The rectus muscle and this piece of fascial flap was sutured to Poupart's ligament very snugly over the cord which was pressed against the pubic bone.

The defect was further covered by bringing down the rectus muscle and its sheath and the more mobile internal oblique to Poupart's ligament. Even with this technique the probability of recurrence after the most painstaking plastic operation would be from 10 to 15 per cent. If this type of hernia can be recognized before operation soldiers bearing it should not be subject to operation. They should either be discharged from the army or placed in limited military service.

TREATMENT OF FLATFOOT.

Newman (*New York Medical Journal,* May 25, 1918) gives a summary of treatment which would not meet with universal acceptance upon the part of the orthopedic profession, but which, on the whole, probably represents current practices.

In static cases due to disproportionate weight he advises the application of a flat-foot-plate, massage and electricity to strengthen the muscles, and exercises, such as rising on the toes, walking with the foot in a varus position. When the symptoms have disappeared, the plate should be gradually discontinued. When the foot is too tender for the use of a plate, rest in bed with a plaster cast applied is beneficial.

Where eversion is well marked, a steel bar running up the outer side of the leg and supplied with a strap which passes around the internal malleolus and pulls the ankle out should be applied. Plates and supports are useless unless the deformity can be corrected. If the foot is fixed in deformity an anesthetic may be given and the deformity overcorrected with the hands or the club-foot wrench and a plaster cast applied, a support being used when the pain has disappeared. Paralytic cases are treated by transplantation of nerves. The peroneus brevis is passed under the tendo achillis and attached to the scaphoid and the peroneus tertius attached to the same point after being passed beneath the anterior tendons. The extensor longus pollicis or the tibialis anticus may be passed through a hole bored in the scaphoid and turned back and sutured to the periosteum. When the condition is osseous, a wedge of bone may be removed from the inner side of the tarsus. Osteotomy of the neck of the os calcis and astragalus, removal of the scaphoid, supra-malleolar osteotomy, longitudinal section of the os calcis with displacement downward of the posterior fragment, all have been resorted to, with reports of success in several cases.

METHOD OF CITRATED BLOOD TRANSFUSION.

ROBERTSON (*British Medical Journal*, April 27, 1918) states that although the method of citrated blood transfusion is very simple, definite precautions must be observed or the blood will undergo changes, while outside of the body, that may render it toxic. The chief consideration is to get the blood quickly and cleanly into the citrate solution so that coagulation changes, which always begin the moment the blood leaves its containing vessel, may be stopped as soon as possible. The passage leading from the vein to the citrate must be of large diameter, as short as convenience will permit, and absolutely clean. The blood must be well mixed with the citrate at once. With unsuitable apparatus, clotting will probably occur in the tube system, which although it may not entirely occlude the lumen, will retard the flow to such an extent that the blood undergoes considerable change before reaching the citrate. This is the kind of blood which tends to produce reactions when transfused. With properly constructed apparatus and careful technique, reactions ought to be of infrequent occurrence.

Apparatus is made up of a wide-mouthed, well-cleaned drug bottle with a capacity of 900 to 1000 Cc. to serve as the transfusion bottle. It should be short and wide, rather than long and narrow, since this shape diminishes the length of intake tube necessary. Three marks are made on the bottle with a file, one at the 660 Cc., one at the 760 Cc., and the other at the 860 Cc. levels, indicating 500, 600, and 700 Cc. of blood respectively. It is well to use at the same time a glass pencil to make the marks more distinct; 160 Cc. of a 3.8-per-cent solution of sodium citrate (isotonic), made up with freshly distilled water and filtered, is placed in the bottle, which is stoppered with a cotton plug wrapped in gauze. A second piece of gauze is tied on over the stopper and neck of the bottle. It is then autoclaved —half an hour at 105° C. should be the minimum. Where a number of transfusions are being given half a dozen or more of these bottles are prepared at once.

The needle should be of a large bore—1.5 to 2 mm. internal diameter was found to work well—and not more than 3.5 cm. long (1.5 in.). It should have a fairly large olive-shaped base. The needle is the most important part of the apparatus, and requires careful attention. Before each bleeding it should be carefully sharpened. The most important consideration in the sharpening is to produce a good spear-point. If the point is well protected when not in use by a metal barrel or piece of rubber tubing sharpening will require only a moment or so. The needle must be kept scrupulously clean, and after each bleeding should be washed out at once, all fragments of fibrin or clot removed from the base, and small pieces of cotton-wool soaked in liquid paraffin thrust through the lumen with the

stilette. The whole needle is well oiled before being put away.

The rubber connection should be flexible, and not more than 8 cm. long (3 in.). The inner surface should be smooth, and the lumen slightly smaller than that of the glass inlet tube. If the rubber connection fits snugly over the base of the needle tying it on is not necessary.

The glass inlet tube is made of a large-bore glass tubing about 6 mm. internal diameter. It should extend below the level of the solution in the bottle.

The needle employed has a bore about half the size of that used for bleeding. The length is not important. As shown, the needle is attached to a short glass tube by means of a small piece of rubber tubing. A needle with a close-fitting connection is more easily handled. The metal connection is slipped into the open end of the rubber tube beforehand. The free end of the glass tube is thrust into the end of the long rubber tube after the needle is in the vein. The rubber tube may be of any convenient length. The glass tube is bent so that the end projects into the lowest part of the bottle. In this way almost every drop of blood in the bottle may be given.

The bulb of an Ingram syringe serves as a pump with the valves arranged as in the diagram shown in the *British Medical Journal*. Suction or pressure can be made by reversing the ends.

As to the procedure of bleeding, a tourniquet is applied to the arm and as large a vein, and as high up as possible, is chosen and the needle is thrust in toward the hand; opening and closing the fist and flicking the skin below the point chosen for venepuncture aids much in dilating the veins. At the point selected for puncture a small amount of novocain is injected intracutaneously. The tourniquet is then released. The vein is filled with solution by light pressure on the bulb. The tourniquet is then tightened sufficiently to make the veins stand out, a small nick is made through the skin over the vein with the point of a scalpel, and the needle is inserted in the vein. It is then pushed into the lumen of the latter and the blood follows the column of the solution down the tube without leaving an air space. A moderate degree of suction is maintained, and the donor continues to open and close his hand slowly, care being taken that he does not move his arm. Hence the needle must be kept immobile and the bottle is lightly agitated every few seconds to insure thorough mixing of all the blood. An amount of blood as large as 800 Cc. may be taken into 0.7 per cent of citrate if the blood flow is well maintained and the blood and citrate thoroughly mixed. In bleeding quantities over 700 Cc. the flow through the needle frequently begins to slow up. Forty transfusions were given to 38 patients suffering from hemorrhage and shock, chiefly the former. The quantity varied from 400 to 700 Cc. Blood-pressure increased from 20 to 40 points. The general improvement was maintained and increased. The patients stood operation well and subsequent progress was as satisfactory as is ordinarily seen, following transfusion. The mortality was 34 per cent. In several instances there was slight chilliness during or immediately following transfusion. The main advantage is that it is a one-man job.

DESTRUCTION OF THE NITS OF THE CLOTHES LOUSE BY SOLUTIONS OF CRESOL-SOAP EMULSION AND LYSOL.

Bacot and Lloyd (*British Medical Journal*, April 27, 1918) conducted a series of experiments with a view to determining methods of destroying the nits of the clothes louse. From conversations with officers in charge of the establishments devoted to the disinfection of the clothing, it appears that a precautionary measure frequently employed is to steep infected garments in a vat containing solution of cresol-soap emulsion. There exists, however, some uncertainty as to the strength of the solution and period of immersion necessary to destroy the nits of *Pediculus humanus*. In this connection it may be pointed out that overlapping methods of disinfection should, if possible, be avoided in the interests of economy. Hot water or dry heat at 55° C.

destroys both nits and active lice within thirty minutes, even when protected by a covering of khaki cloth; while if the temperature is raised to 60° C., fifteen minutes suffice. If at any period during the process of washing or drying garments they are subjected to the temperatures and periods above given, chemical solutions are unnecessary; if, on the other hand, the garments are steeped in effective chemical solutions, then it is unnecessary to use temperatures so high as those mentioned for washing or drying.

In utilizing the results of the present experiments for practical disinfection it must be borne in mind that solutions of both cresol-soap emulsion and lysol degenerate in their effectiveness for the destruction of bacteria in relation to the organic matter with which they become charged during use, and it is probable that a somewhat similar fall in their effectiveness for the destruction of nits may occur. It has not been possible so far to ascertain if this probable drop in efficiency occurs, owing to our lack of knowledge of the exact condition of use. If samples of solutions actually employed could be forwarded to the Lister Institute, with the necessary data as to strength and the relations of quantity of fluid and period of use, and the number of garments treated, it would be possible to carry out the experiment necessary to obtain information on this point.

Pieces of army shirt flannel on which numerous nits had been laid were immersed in the solutions for the periods shown in the accompanying tables; they were then taken out, and the superfluous fluid removed by placing on filter paper for a few minutes. After this they were placed in small entomological boxes lined with a strip of dry flannel, and carried in a thin cotton bag, suspended from the neck between skin and shirt, to incubate.

On examination of the tables it will be noted that the lysol (crude carbolic acid and soft soap emulsion) solutions are decidedly more effective than the cresol-soap emulsion solution at the higher temperature, but less so at 32° F. An interesting feature of the series is the regular rise in the percentage of lice which die while hatching as the action of the solution becomes less fatal up to a mid-point, when it again declines to a minimum in proportion as the hatching ceases to be checked owing to the weakness of the solutions. It is a matter of question whether death during escape from the egg is due to the action of the fluids on the eggshell or to a want of robustness in the larvæ.

The evidence as a whole seems to establish the fact that steeping for twenty minutes in a 2-per-cent solution, either lysol or the cresol soap, is quite effective provided the temperature is not below 50° F.

EXCISION OF GUNSHOT WOUNDS.

Brock (*Surgery, Gynecology and Obstetrics,* May, 1918) notes that superficial wounds are frequently given little consideration at casualty clearing stations. A hasty dressing, dry or moist, in eusol is applied, or the wound is bipped. The patients arrive at the hospital within twenty-four to forty-eight hours. Many show marked infection. Others with less ample drainage require immediate operation. Many wounds sutured at the casualty clearing stations require immediate removal of sutures when the patients arrive at the base hospitals.

BARANY CHAIR TESTS AND FLYING ABILITY—A CORRELATION STUDY OF ONE HUNDRED NAVAL AVIATORS.

Parsons and Segar (*Journal of the American Medical Association,* Volume LXX, No. 15) in order to arrive at a just conclusion of the value of the Barany chair test, on the basis of which thousands of aviators, otherwise entirely suitable, have been either rejected or accepted, made a careful study of 100 aviators, taking into consideration the mental aptitude and special adaptability to the game of life, power of prompt decision, sense of balance, control of the machine and skill in landing. Judgment of flying ability is based on these factors, and the men are grouped into three classes: good, average, and poor. As the

result of the studies they can adduce no evidence to the effect that there is any relation between the ability to fly and the findings afforded by this test.—*Cleveland Medical Journal,* May, 1918.

LYMPHATIC DISEASES IN CHILDREN SIMULATING APPENDICITIS.

BARS (*American Journal of Diseases of Children,* June, 1918), on the basis of having seen several cases (seven in all are reported) of suspected appendicitis in children, which on exploration disclosed strikingly similar features, makes the following contribution to the study of such cases:

They were all children under puberty, or who had just reached puberty. Attention was centered on the appendix because all the signs, symptoms, and clinical evidence suggested this part as the offender. The symptoms were attributed to obstruction of the lumen by the hyperplasia of the lymphoid tissue. To this obstruction in turn was attributed the colic and reflex intestinal motility. As to the results following operation, one patient was well in fifteen months. The other patients have not been heard from.

All presented a symptom syndrome suggestive of recurring attacks of appendicitis, not exactly the typical, text-book picture, but each presenting almost the same features and omitting others which are usually in evidence in a true infectious appendicitis. Thus, in each, the abdominal pain was the most prominent symptom, coming on in attacks lasting from a few hours to a couple of days. Each complained of nausea which in some instances led to vomiting. Constipation was a frequent complaint. Usually there was headache. In all, the pain was more or less localized in the right lower abdomen, and did not radiate.

The clinical and laboratory findings were all strikingly similar. No patient had fever; none presented a leucocytosis; urine and blood tests were in every case normal. A Roentgen-ray examination was made in five of the cases, and in four of the five there was a definite ileal hypomotility. The Wassermann was negative in all. In no case was any other pathology discovered than abdominal tenderness in McBurney's region. In every case the history and findings were more like appendiceal trouble than any other disease with which the author was familiar, and in four instances the roentgenologist, from his standpoint, agreed with him. Yet in each and every case the pathologist reports simply and succinctly, "lymphoid hyperplasia." In two cases he amplified this to suggest the possibility of a lymphatic constitution or lymphatism.

POSTOPERATIVE OBSTRUCTION.

LOUIS (*Cleveland Medical Journal,* May, 1918), reporting a difficult case, observes that obstruction due to bands and adhesions comprises about 30 to 40 per cent of cases from whatever cause. The important considerations are:

To prevent as far as possible the formation of adhesions and the production of a kink. This consideration has been dealt with at length by many writers and may be dismissed quickly by the statement that even in the hands of the most careful surgeon adhesions will develop, a few of which may give rise to an obstruction. Indeed, it is a very remarkable fact that there are not many more such cases of obstruction, when one stops to consider the great amount of trauma necessarily produced by any laparotomy and the numerous raw surfaces left for nature to cover up. The most important consideration is:

The recognition of the condition and its proper treatment.

In most cases the diagnosis is easily made. Pain is always present. The character of this pain is the differential point distinguishing it from other conditions, as postoperative paralytic ileus, acute dilatation of stomach, peritonitis, and ileus due to mesenteric thrombosis. Intermittent, rhythmical, colicky pain is absent in paralytic conditions of the bowel. Here there is no peristalsis and the pain if present is constant and due to increased tension. Localized peristalsis is absolute when present,

but one should not need to wait until it appears.

Vomiting is almost always present in postoperative ileus and differs in character from the type seen in adynamic obstruction. In the former the vomiting is projectile, in the latter it is more of a gulp, an overflow. Nothing can be said regarding the character of the vomitus. This depends upon the location of the obstruction and its duration.

Distention also depends upon the location of the obstruction. When the kink is in the small intestine, distention is not marked until very late. When low down in the large intestine it appears earlier. But despite the location of the obstruction, it may safely be said that in the adynamic forms of ileus, distention is much more marked.

The temperature, leucocyte count, general condition of the patient, and the facies are important aids in the differential diagnosis but are not in themselves conclusive.

The treatment of ileus due to bands is at first medical, then surgical. The medical treatment is observation, enemata, etc. Morphine is bad, since it relieves the patient temporarily and masks symptoms, thus prolonging the observation period perhaps even to the point where surgical intervention becomes hazardous. Pituitrin and cathartics are not entirely contraindicated, as is the teaching. When used early in the course when the patient's general condition is good, they may not only be the means of making a more early and surer diagnosis, but also may by the more active peristalsis set up actually overcome the obstruction. The author has had this experience with two of his cases since the first of the year. This point also emphasizes the value of their use in the prevention of an obstruction. For it is obvious that adhesions are less likely to form in a bowel that is being kept active.

Surgical treatment should be instituted as soon as diagnosis is certain and as soon as it becomes apparent that the obstruction will not in itself be relieved. This will appear as a rather indefinite statement. Any one, however, who has observed several of these cases will readily appreciate and agree with the author that when the diagnosis is certain nature cannot in itself relieve the obstruction.

Louis observes that postoperative ileus is not distinguishable from dilatation of the stomach excepting by the use of the *x*-ray. In all cases of dilatation of the stomach progressive distention along with the rapid pulse is marked. The patients complained of no pain, excepting the discomfort which dyspnea and distention gave them. These patients invariably stated that they were "feeling fine." This feature is considered by most writers as being very significant and often misleading.

Progressive painless distention with dyspnea and rapid and feeble pulse, patient vomiting frequently and at the same time having an amiable expression and telling you that he is "feeling fine," is sufficient evidence to make the diagnosis of dilatation of the stomach or paralytic ileus, which physiologically and pathologically is the same and differs only in its location.

THE NEW METHOD OF JOINT FORMATION IN ARTHROPLASTY.

PHEMISTER and MILLER (*Surgery, Gynecology and Obstetrics,* 1918, XXVI, 406) state that Textor, in 1843, reported an ankylosis of the elbow resected at the age of fifty-one, where, six years later at autopsy, there was full range of motion. Ferguson, in 1861, showed a girl of twenty who had almost complete mobility and weight-bearing capacity in the limb five years after resection of the knee for tuberculosis. The historical evolution of the use of flaps, free and pedunculated, interposed between the bone, is given. Then the authors describe extensive experiments of their own upon dogs.

In the no-flap operations a joint cavity forms. Articular surfaces form on the ends of the bones; over the prominent portions where there is pressure a dense bony surface forms, smooth and shiny; over the sides a fibrous covering forms. As time goes on the fibrous covering tends to spread over the entire bony surface, gradually ab-

sorbing and replacing the dense bare bony surfaces. The range of motion varied from 50 per cent to normal, and persisted even after the extension of the fibrous overgrowth.

In the pedunculated flap operations the flap undergoes pressure necrosis and disappears, except about the margins and in the grooves. As motion is reëstablished more and more of the remaining portions are destroyed, until little is left. The changes in the articular ends of the bones are practically the same as in the no-flap method. The size and appearance of the joint and the range of motion are about the same as in the no-flap operations.

In the free-flap operations the flap breaks down and disappears in the same manner and to about the same degree.

Hence it matters little, according to this experimental work, whether arthroplasty is done without or with flaps, free or pedunculated. The important steps are the construction of a well-fitting joint, the excision of obstructing fibrous tissues, and proper after-treatment for the maintenance of mobility.

THE PNEUMOGASTRIC SYMPTOM.

DUBARD (*Journal de Médecine et de Chirurgie,* April 25, 1918), on the basis of an extensive operative experience, describes what he calls the pneumogastric sign due to a neuritis of the vagus of pulmonary origin, extending its influence to the gastrointestinal distribution of this nerve and causing trophic troubles which predispose to the development of ulcers and other inflammatory lesions of the digestive tract. He notes that 80 per cent of his gastric ulcer cases were instances of patients who had in former times suffered from pulmonary tuberculosis. In 45 per cent of his gastroduodenal ulcers he removed the appendices in 18. In the remaining cases the operation was done because of cancer or as a complement to infection upon the biliary passages. Indeed, he has learned by experience that it is wise if the patient's condition permits to do a cholecystostomy, a cholecystectomy, or a gastroenterostomy. Thus he asserts the danger of postoperative spasm of the pylorus is done away with. Inflammation of the pneumogastric nerve causes not only dyspepsia, asthma, and palpitations, but also dystrophies, and in one autopsy the pneumogastric presented the lesions of both a perineuritis and a degeneration of the nerve fibers. This was an old tuberculous case whose gastric ulcer perforated. He ultimately died from chronic appendicitis and subphrenic abscess. The author considers that the pneumogastric sign, because of its frequency and the facility with which it is detected, should be placed beside other signs upon which the diagnosis of tuberculosis is based.

TREATMENT OF SEPTICEMIA BY PASSIVE INTRAVENOUS INJECTIONS OF SACCHARATED SERUM.

AUDAIN and MASMONTEIL (*La Presse Médicale,* quoted in *Journal de Médecine et de Chirurgie,* April 25, 1918) attribute to this activated serum a leucogenic function, since the count rises very shortly after the injection from 5000 to 7000, to 25,000, indeed, in less than half an hour, and was continuous for two or three hours; it then dropped to 16,000. There is a transitory elevation of temperature, .7 of a degree, usually heralded by a heavy chill and followed by a drenching sweat. The value of the injection is based on its power to inhibit the formation of the leucocytes. Moreover, it is distinctly nutritive since the daily injection of 100 grammes of sugar distinctly adds to the patient's resources. Finally, it has a diuretic action and is a stimulant. By employing isotonic solution there is no fear of a hemolytic action. Glucose, saccharose, or lactose may be employed. Whichever is used should be isotonic—*i.e.,* 47.60 to 1000 for glucose; 103.50 to 1000 for saccharose; 108.90 to 1000 for lactose. Usually from 300 to 500 grammes are injected at first. Later when patients are profundly septicemic and have had previous treatments from 1000 to 2000 grammes may be injected daily, given in two or three doses. The test of the quantity to be employed is based on the leucocytic count. This should

be driven up to about 25,000. Another sign of adequacy lies in the development of a heavy chill.

The authors state that they have not treated many cases, but that the results obtained are very encouraging. They consider the treatment as long as twelve days with heavy doses, and have observed a fallen temperature and pulse-rate, free diuresis, and the development of multiple sterile abscesses. Treatment is not stopped until fever has disappeared four or five days.

A SPECIFIC FOR EVERY PATHOGENIC MICRO-ORGANISM.

Under this attractive title EDWARD H. OCHSNER (*New York Medical Journal*, June 1, 1918) contributes an article based on the fact that whilst the basis on which homeopathic and eclectic medicine was built up—*i.e.*, upon symptoms alone—doomed the practice of these cults to frequent failure, to-day, with more accurate knowledge of infections, the theory of specific treatment is not only sound, but its application is feasible. Concerning anthrax and glanders the author has no specific to offer, nor against influenza bacillus. As to the gas bacillus he quotes the experience of others to the effect that injection of oxygen, malic and tartaric acids, and quinine hydrochloride are potent in inhibiting the growth of gas bacilli in culture media, whilst blastomycosis seems to yield to potassium iodide, supplemented by good surgery. As to acute articular rheumatism he believes that 60 grains of sodium salicylate dissolved in eight ounces of normal saline and given by the rectum once or twice a day comes very near to being a specific. Thus the colon bacillus specific is an injection of from five to 25 million dead bacilli given once or twice a week. Against gonorrheal infection he advises the use of from five million to 25 million dead gonococci applied at intervals of five to seven days, and he quotes Pusey to the effect that iodoform is a specific against chancroid.

In malignant edema Fenger is quoted as recommending infiltrating the healthy tissue all around the infected area with glacial acetic acid, this to be followed by excision or high amputation. Against noma he has found bromine fumes very effective. Against impetigo contagiosa he has found a five-per-cent yellow oxide of mercury ointment, or a three-per-cent ammoniated chloride of mercury ointment, very effective in this condition. Prince is quoted to the effect that a daily application of spirits of camphor to each pustule is very effective. Rodent ulcer he treats by wide excision, with subsequent plastic or skin graft. Actinomycosis is treated by wide incision and potassium iodide 60 grains a day for three days, followed by an interval of four days and then repeating.

Against tuberculosis, vaccine is employed in minute doses, together with the surgical indication of rest; against rabies, free opening and packing with a piece of gauze saturated in Churchill's tincture of iodine, leaving in place for ten to fifteen minutes. After this a 50-per-cent alcohol dressing is indicated, and thereafter Pasteur treatment. For tetanus, thorough opening of the wound; thereafter swabbing with 95-per-cent carbolic acid, which should be left in place for a few minutes, then washed out with 95-per-cent alcohol. Then immunizing doses of tetanus serum are given.

For erysipelas, wet dressing consisting of a saturated solution of boric acid in water, with from 15 to 33⅓ per cent of 95-per-cent alcohol, is the most comfortable for the patient and seems to be the most effective in aiding the production of immunity and hastening convalescence. Against streptococcus, staphylococcus albus, staphylococcus citreus, and diplococcus of Weichselbaum, boric acid in water with alcohol in the proportions above mentioned seems the best dressing; indeed, this is regarded as a specific. If the infection is superficial, first painting the reddened area with 95-per-cent carbolic acid until it turns white and then washing this off with 95-per-cent alcohol instantly relieves pain, destroys myriads of bacteria, and considerably hastens recovery. The same dresssing is used against pemphigus vegetans. Against staphylococcus

aureus infections, as, for instance, furuncles, painting each furuncle with 95-per-cent carbolic acid, then applying a wet dressing of 50-per-cent alcohol, and then a five-per-cent yellow oxide of mercury salve, is most effective. An autogenous culture should be made before this is done so that from 5 to 25 million dead staphylococci may be injected once or twice a week. In furuncles of the nose the central hair should first be epilated, then the furuncle treated with 95-per-cent carbolic acid on a probe armed with a small cotton pledget, this neutralized with 95-per-cent alcohol, and then five-per-cent yellow oxide of mercury applied. In carbuncle injection with 95-per-cent carbolic acid into the base is urged as the most effective method of all tried; thereafter a wet dressing of 50-per-cent alcohol; later, five-per-cent yellow oxide of mercury ointment. Where possible cultures are taken and an autogenous vaccine made. Blair is quoted to the effect that splendid results may be had by excising carbuncles with the electric cautery.

Against pyocyaneus Taylor is quoted to the effect that a one-per-cent acetic acid solution is practically a specific. In saprophytic infections, particularly those appearing in the form of old leg ulcers, compresses are applied wet with two grains of chloral hydrate to each ounce of water, the dressing being kept moist constantly.

The article closes with a criticism of Dr. Carrel and his methods, neither of which seems well founded on either knowledge or experience.

FISTULA IN ANO.

EDWARDS (*Lancet*, May 11, 1918) thus defines the causes of failure after fistula operation: First and foremost, the topography of the fistula is not thoroughly recognized, and thus a part of the fistula's track escapes division. Secondly, caries of the coccyx, or even of the ischium, is a not infrequent cause of a persisting fistula, and unless this is discovered and dealt with a cure is impossible. Thirdly, tubercle; but although a certain small proportion of fistulæ are tuberculous, it is astonishing how readily healing takes place after operation in the majority. When it does not the operation wound remains open and gaping, but the fistula as such may no longer exist.

In extensive cases it is well to divide the operation into two parts.

At the first operation lay open freely all sinuses running into the main posterior track, and when these are nearly healed, say in a month's time, the dorsal track into the bowel can be incised. This method, "a deux temps," has these advantages: (1) The wound has been extra-rectal and, therefore, almost free from all fecal contamination. (2) It lessens the gravity of the operation. (3) There is a chance, remote though it may be, that the fistula will heal without any division of the sphincter.

In cases in which there is a sinus running up the bowel, the whole operation should be done at one sitting, as it gives this track a better chance of becoming obliterated, especially if it is outside the muscular coat of the rectum, and has, therefore, not been laid open, but merely dilated and curetted. When the sinus is between the mucous and muscular coats it should be laid open. If by any chance a sinus has been missed and the surgeon has laid open the fatty tissues of the part without seeing the granulation-lined track at the bottom of the wound, this should be closed with buried catgut sutures.

The successful issue of a case must necessarily depend a good deal on its after-treatment. After the first dressing or two the daily toilet of the part should be painless to the patient. The method he recommends is as follows:

The finger, well coated with vaselin, should first be passed into the rectum, avoiding the wound, whilst the patient is urged to strain out as though at stool. A dressing of sterilized cotton-wool or gauze wrung out in warm boric or biniodide lotion is now carried up by a probe-pointed director along the finger which makes pressure away from the wound, acting as a retractor, thus giving room for the gentle packing of the wound without the use of any force. The dressing should not be bulky but only sufficient to insure the wound healing from the bottom.

In cases in which the division of a high-lying track would involve the internal sphincter, it is, as already mentioned, best not to lay this open into the bowel, but to content oneself with enlarging it by an incision away from the rectum sufficient to give passage to the finger. The whole tract should be curetted and packed with a long strip of gauze. From time to time during convalescence this sinus should be syringed out with a strong solution of argent. nit., gr. xx to the ounce, by means of a sinus syringe, or in lieu thereof a probe coated with this salt may be employed. In this way a cure generally ensues.

Another point which is helpful to a speedy convalescence is the avoidance of a prolonged confinment in bed. Most of his patients begin to walk about by the tenth day, and even in extensive cases of "horseshoe" fistula three weeks of bed is usually enough. Sitting, however, is another matter; thus, at first, he recommended walking exercise rather than taking the air in a motor or carriage.

LIQUID-TIGHT CLOSURE IN THE TREATMENT OF WOUNDS.

W. H. TAYLOR and N. B. TAYLOR (*Lancet*, May 11, 1918) describe an improved apparatus by which they may render a wound air-tight during irrigation and so dependably water-tight that any desired degree of positive or negative pressure may be employed. This end is attained by means of an ingeniously constructed rubber cover, which fits close to the skin surface around the wound. This cover is bandaged in place, and by means of an irrigator flask the fluid is allowed to run in the top of the cup through an inflow tube, there also being an outflow tube which is clamped. When no more fluid will run in, the inflow is clamped and the outflow released. A positive pressure is advised from 6 to 12 inches as measured by the height of the liquid. Negative pressure is about the height of the bed. The results they record as follows:

Certain phenomena have been observed to follow so constantly the employment of this method of irrigation that the authors are able now to predict their appearance. Though their investigations as yet have been largely confined to stubborn old sinuses, and not to recent wounds, this form of irrigation has on many occasions been instituted at the time of an acute flare-up. They have not, it is true, an imposing array of cases as regards number, but their results have been of a very positive nature. They state that they do not propose to weary their readers with individual instances, but shall wait until their series is compiled for presentation in tabulated form. The results which they have observed may be epitomized as follows:

1. Rapid softening of indurated tissues and return to normal color.

2. Disappearance, often within twenty-four hours, of swelling.

3. Profuse discharge of pus for first twelve hours, and rapid diminution afterwards, the secretion becoming seropurulent, then lymphoid in character.

4. On an average, in chronic cases, the wound is cleansed of pus in thirty-six hours—*i.e.*, pus is removed as soon as formed.

5. Granulations become bright in color and bleed more readily. After four or five days if the device be removed an old chronic sinus usually fills up with lymph and blood.

6. The almost instant relief from boring pain which may have worried the patient for months.

The improvement in general health and morale of patient incident to these local changes is often remarkable.

The authors thus summarize their views regarding this treatment:

Penetration of fluid to, and tidal evacuation of, distant loculi, resulting in thorough mechanical cleansing of wound cavity.

Establishment during negative pressure of outward flow of lymph with, presumably, its quota of bacteria.

Avoidance of large mutilating incisions that are required for evacuation of deep pockets and the insertion of fluid-conducting tubes.

The concentration of antiseptic or hypertonic fluid remains constant, since the

freedom of its delivery into the wound being unrestricted, the solution can be frequently renewed.

The ease with which the beneficial effects of heat in interior of wound may be secured.

Elimination to a large extent of the personal equation.

Insurance of dry beds and sense of comfort to patient, who is enabled in many instances to be out of bed whilst undergoing treatment.

Economy in time, effort, and material.

Presumed adaptability of its use to dressing stations and ambulance trains.

PRIMARY CAUSE OF SHOCK.

TURCK (*Medical Record,* June 1, 1918) observes that the war reports show that the wounded are seldom in a state of shock at first, not until twenty-four hours after the injury, and that the immediate or nervous shock is comparatively rare. He further states that if you transplant wounded or injured tissue from an injured animal to another animal the latter dies from shock, while the original animal, with the burned tissue removed, survives. It must be removed early because the injured tissue begins to undergo self-digestion, out of which toxic albumins are formed which being absorbed are deadly poison. The action of shock is staged in the splanchnic area, especially the upper abdomen, stomach, intestines, and liver. These excretory and detoxicating organs receive the first brunt of the reaction we call shock. The nervous system does not enter into this reaction. Falling blood-pressure and temperature, metabolic failure and loss of ferments, alkaline bases, CO_2 and O are secondary results. Immunity has been secured by repeated and increasing doses of the homologous autolyzed tissues so that a high degree of immunity against shock may be established without symptoms. Heat of high degree applied so as to influence promptly the splanchnic area materially increases the immunity against shock if used early after the injury. Wounds of the thigh, buttocks, and trunk give the greatest degree of shock. Turck experimentally has found that placing an animal close to a centrifuge revolving 10,000 revolutions per minute resulted in small lesions or multiple zones in every organ of the body. Post-mortem examinations resulted in findings which are found in ordinary wound shock.

Turck states that the nervous system plays a rôle in shock. However, the manifestations there are apparently secondary. As to pathology of the viscera, excepting the brain and spinal cord, they showed marked congestion and hemorrhages.

As for treatment of shock produced by wounds, burns, exposure, handling of the viscera, artificial "shell-shock," all seem to result in one and the same condition, namely, rapid autolysis of the injured cells, the products of such autolysis causing the classical syndrome of shock and death.

Repeated small injections of these autolyzed tissue cells or their products result in so high a degree of immunity that one hundred times the fatal dose can be injected without producing symptoms. Furthermore, it has been experimentally demonstrated that immunized animals are refractory to the procedures which produce shock. Moreover, immunized animal wounds heal more readily and seem less susceptible to infection.

In 1896 the author showed the analogy of proteose intoxication and shock symptoms, and that these were akin to snake poisoning. In the case of snake poisoning the most effectual method of treatment is to tie up the leg or poisoned area and remove the tissue; later injections and other methods of producing immunity are to be used. In the treatment of wound shock we may carry out the analogy. This may be done by the prompt application of strong antiseptics and astringents (such as formalin 15 per cent and bichromate of potassium) to stop the absorption of the toxins and prevent bacterial growth, and the administration of non-toxic and anti-autolytic substances according to the indications. The prophylactic measures of the

elastic ligature and of removing all autolyzing tissue that endangers the victim (*débridement*) are generally acknowledged to be the first indication in wound treatment.

THE ASSOCIATION OF PRURITUS WITH PYORRHEA ALVEOLARIS.

CLEMONS (*Medical Record,* June 1, 1918) observes that the importance of focal infection as a direct and indirect cause of pathology is becoming more and more evident. He gives a clinical picture of pruritus ani and states that the organism which is the etiological factor in true pruritus is the streptococcus, accepting the teaching of Murray. Also, the belief that pruritus is controlled by the use of autogenous vaccines. The type of infection is regarded as secondary because of the absence of inflammatory symptoms, and asserts for its cause pyorrhea alveolaris is selected as the predominant one. He would therefore suggest that when a patient presents himself with pruritus ani the teeth should first be extracted, thus saving the rectal mucosa from a constant bath of swallowed streptococci. Next, he advises drainage of the rectal mucosa by removing the lateral and cutaneous tissue, at the same time drawing down and suturing the adjacent rectal mucosa and the fascia between the external and internal sphincters. To such a description of the procedure even an enthusiastic proselyte to this somewhat novel doctrine would have difficulty in giving an accurate interpretation upon the body of the patient.

SCALP FLAPS AND DEPILATION IN PLASTIC SURGERY.

COLE (*The Practitioner,* June, 1918) observes that hair grows freely on flaps taken from the scalp, and hence such flaps are often not available for remedying defects of hairless areas of the face. The advantages of a scalp flap are obvious. The area of tissue available is large, the residual scar is covered and screened from view by the surrounding hair, and the blood-supply is so good that no fear need be entertained about the nutrition of flaps reaching even to the midline of the vertex.

The first patient he describes had a gross defect filled by a scalp flap and depilated by the application of *x*-rays. This patient had previously had six operations to close a large lesion of nose. A lateral flap was carried over and survived. The depilation was complete six months later. The objections often urged against this method of removing hair—*i.e.*, that it is not permanent or that it will produce an eczematous condition of the skin—are not justified by these cases. No hair has grown on the flaps and the skin has remained soft, pliable, and perfectly healthy. In some cheek defects the depilated area of skin has been inverted to replace mucous membrane.

The use of scalp flaps to remedy defects in hair-bearing areas of the face is by no means new. The author believes that formation of an entire upper lip by means of bilateral, transferred, pedicled scalp flaps is, however, an entirely novel departure in plastic surgery. The patient was first seen by the author after many unsuccessful operations. The mandible was viciously united and the mouth cavity was practically non-existent. There are a number of illustrations, the latter showing the patient with a well-grown mustache of natural origin.

CEREBRAL EDEMA: ITS CAUSATION AND TREATMENT.

RAWLING (*British Medical Journal,* May 4, 1918) observes that under normal conditions there is no fluid in the subdural space and none escapes when the subdural space is exposed. Cerebral edema of the brain presents a boggy appearance, and the cortical edema can be very prettily demonstrated by applying gentle pressure with a sponge, the excess fluid being momentarily squeezed aside to return as a wave so soon as the pressure is removed. The excess fluid seen at the operation will continue to run away during the sewing up of the wound and may ooze from the subtemporal tissue both during the healing process and subsequently.

If lumbar puncture be carried out in a case of cerebral edema, as a preliminary diagnostic measure, the excess fluid is demonstrated, both by the pressure under which it escapes and the quantity that can be collected in a given period of time.

What is the cause of this cerebrospinal excess? Professor Halliburton, from physiological experiments, states that there are three groups of substances which promote the flow and increase the pressure of fluid, independently of those which affect it secondarily by altering the blood-pressure —excess of CO_2, volatile anesthetics, and extract of choroid gland or brain.

The arterial pressure has but little effect on the amount of secretion.

It is accepted that the cerebrospinal fluid is formed either as an active secretion from the choroid plexuses of the lateral, third, and fourth ventricles, or by a process of filtration through the choroid capillaries.

It is accepted that the greater part of this fluid passes from the ventricular spaces through the foramina in the roof of the fourth ventricle to the cerebral subarachnoid system and spaces.

It is accepted that it exists at very much the same pressure as the intracranial venous system, but slightly above the venous pressure.

It is accepted that, under normal conditions, it is absorbed as formed into the cerebral venous channels, more especially into the lateral lacunæ of the superior longitudinal sinus.

If for any reason the absorptive capacity of the veins is impaired, either by disease or injury, due absorption cannot take place and cerebrospinal fluid collects in excess in all possible spaces.

In the earlier stages of cerebral edema the excess fluid will escape in the following manner: a small quantity passes down the neural canal, to be withdrawn, perhaps, by lumbar puncture, with some temporary relief to the increasing intracranial pressure; a still smaller quantity permeates through the various emissary channels at the base of the skull, to be absorbed by the extracranial venous channels. As the fluid increases in quantity these means of escape prove inadequate, and it accumulates first in the subarachnoid region, bogs the surface of the brain, and finally exudes through the arachnoid into the subdural space, giving rise to the typical picture of a case of cerebral edema.

The drainage of this excess cerebrospinal fluid, the result of deficient absorption into the cerebral venous system, by means of trephining and dural opening, permits of the escape of the fluid from the confined space in which it is pent up and allows of its coming into contact with new tissues where it can be absorbed. The primary cause (temporary or permanent changes in the walls of the cerebral veins) is beyond the scope of surgery, but by the relief of the general pressure symptoms time and opportunity are afforded for some recovery on the part of the defective venous system, and if that does not happen a secondary path of escape has been made for the superabundant fluid.

Lumbar puncture, however frequently repeated, cannot be expected to bring about more than a temporary improvement at the best.

Operation is indicated in severe and intractable headache, with or without epileptiform convulsions, whether due to heat-stroke, cerebral malaria, shell shock, or neurasthenia. It is obvious that in every case all ordinary remedies, including prolonged rest in bed (the most important of all), should receive a fair trial, but in view of the injurious effect produced on the cortical cells by prolonged soaking in superfluous fluid, operative measures should not be unduly delayed. The author suggests three months as a fair probationary period.

The temporal region offers the most suitable site for decompression. The operation is carried out over a silent area of the brain; drainage is conducted at the most dependent part of the brain; the scar is hidden subsequently by the hairy scalp; the bone defect is in a reasonably safe situation, and the operation involves no special risk when carried out by one possessing reasonable skill in head operations. The right

or left side is chosen according to the distribution of the headache, but if there is no such localization the right side should be selected to avoid any possibility of disturbing the functions of the motor speech area.

The trephine opening should be made low down, immediately above the ear, in the angle between the anterior and posterior branches of the middle meningeal artery. The opening is enlarged mainly in the anterior and posterior directions and downward toward the base of the cerebral fossa. The bone is cut away so as to leave an aperture not less than two inches in the anteroposterior direction, one and a half in the vertical.

The dura is opened in every case by crucial or other incision. The intradural tension is plus, and in consequence the dural incision must be carried out with caution to avoid damage to the underlying cerebral vessels. The temporal muscle, turned down previous to trephining, is sewn into position at the end of the operation. Drainage to the surface should never be employed.

The patients should be sat up in bed as soon as possible. The author advises small doses of morphine for one or two days following the operation, then bromides for a week or two; then they should be gradually discontinued. Patients should be kept quiet in hospital for one month and then sent for prolonged convalescence to some quiet place with open-air treatment and no worries.

In the seven cases submitted to operation immediate benefit resulted. In some the patients were quite free from headache the day after the operation, the first time for many months. In other cases two or three days elapsed before real improvement occurred. In all cases, however, headache of any severity was a thing of the past.

The later histories of these seven men confirm, with certain modifications, the early results.

REVIEWS.

THE THIRD GREAT PLAGUE. By John H. Stokes, A.B., M.D. The W. B. Saunders Co., Philadelphia, 1917. Price $1.50.

By the term "the third great plague" Dr. Stokes refers to syphilis, and not to what has been called "the great white plague," tuberculosis. The book is stated to be a discussion of syphilis for every-day people. In other words, it is designed, we presume, for the laity rather than the medical man. It does not contain illustrations of syphilitic lesions, but it does contain pictures of men who have made notable contributions to the investigation of the disease.

We have frequently discussed the wisdom of preparing books of this character for the lay reader because it is impossible for a layman to understand the pros and cons of a medical subject, the more so, as Osler has well said, that he who knows the pathology of syphilis knows everything in medicine.

In this book the layman is given a chapter upon the treatment of syphilis by salvarsan, mercury, and the iodides. Certain of the chapters deal with the Public Effort Against Syphilis and the Mental Attitude of Patients in regard to their infection. These are quite appropriate, but he who reads these books as a layman will we think get not only the impression that the cure of syphilis is questionable, but in gaining this impression will also get the idea that there is always danger of transmission, which we know is untrue.

Finally, it may be said that the statements made by Dr. Stokes cannot be criticized as inaccurate, nor can they be said to do anything else than represent a fair statement of the subject expressed in simple language for the lay mind. Whether any lay mind can get a correct idea from reading any book on syphilis is another question, which is made more complicated by the fact that only those who are fearful

that they have syphilis will be likely to take enough interest in the subject to read the text.

THE SERIOUSNESS OF VENEREAL DISEASE. By Sprague Carleton, M.D. Paul B. Hoever, New York, 1918. Price 50 cents.

This little book is a reprint of a limited edition arranged by the author as a gift for the use of Base Hospital No. 48. Those wishing to distribute this booklet in large quantities should communicate with the publisher. The matter is presented in a very sensible and novel form. On the left-hand pages there are a few lines in large type describing the picture on the opposite page, often with a line or two added to indicate what ultimately happened to the patient. The pictures are photographs of patients admitted for treatment to the Metropolitan Hospital on Blackwell's Island, New York.

At the close of the book there are two pages of instructions to men suffering from gonorrhea, followed by three pages of instructions to syphilitic patients. These instructions are brief, practical, forceful, and quite capable of ready understanding by the lay mind.

There can be no question that pictures of lesions are of great importance in the carrying on of an "anti-venereal campaign," and this is by long odds the best effort along these lines that we have seen. It does not attempt to deal with the moral aspect of the question, but directly with it as the genito-urinary surgeon meets this condition in public and private practice. If those with excellent intent, who are carrying out the "anti-venereal campaign," will purchase and distribute this little booklet they will do a large amount of good. .

A MANUAL OF OTOLOGY. By Gorham Bacon, A.B., M.D., assisted by Truman L. Saunders, A.B., M.D. Seventh Edition, Revised and Enlarged. Illustrated. Lea & Febiger, 1918.

The author states in the preface that the demand for a new edition for this manual proves that it is still fulfilling its original purpose as a text-book for students, and as a compact book of reference for the busy general practitioner. Those who are familiar with earlier editions can readily understand why this is true.

Dr. Bacon has long enjoyed eminence in the field of otology, and has been a successful practitioner. In the pages of the various editions of his manual he has given the results of his experience with little reference to the work of others, except in so far as it has influenced his own methods. In other words, when one reads this book he gets a definite and clear conception of what Dr. Bacon would do or would think well of doing, if he were present, and no higher recommendation of a clinical manual can be made than this. The book is printed in large type, is easily read, and contains 204 illustrations, with two colored plates.

INTERNATIONAL CLINICS. A Quarterly of Clinical Lectures and Original Articles. Edited by H. R. M. Landis, M.D. Volume II. J. B. Lippincott Company, Philadelphia, 1918.

This issue of the International Clinics begins with seven clinics delivered in hospitals in several large cities. Following this are two articles upon the psychologic handling of tuberculous patients and one upon the early diagnosis and treatment of syphilis of the nervous system. Several articles upon gynecologic subjects follow. There are four surgical articles toward the close of the volume, and, finally, there is a contribution upon the history of obstetrics and gynecology.

THE PRINCIPLES AND PRACTICE OF INFANT FEEDING. By Julius H. Hess, M.D. Illustrated. The F. A. Davis Company, Philadelphia, 1918. Price $2.00.

One of the curious results of the World War is the first title under the name of Dr. Hess on the front page of this book dealing with infant feeding, namely, "Major M. R. C., U. S. Army Active Service." The second titles, however, indicate that he is the professor of pediatrics in the University of Illinois and attending pediatrician to Cook County Hospital and other large hospitals.

His object in presenting the profession with another contribution upon this subject is to bring before the reader his own views as to how infant feeding should be taught

and practiced, and also to provide a text from which nurses who are in charge of either healthy or sickly infants may readily learn what course they should pursue.

The book is divided into four parts, with an appendix of some fifty pages. The first part deals with the anatomy, physiology, digestion, and bacteria of the alimentary canals of infants; Part II with nursing and feeding; Part III with modifications in artificial feeding; and Part IV with nutritional disturbances in the artificial feeding of infants. In the appendix a large number of different subjects are taken up, varying from preparatory baby foods to catheter feeding by the mouth and nose, enteroclysis, dentition, etc.

From what has been said it must be evident that the author has not endeavored to present an ultra-scientific discussion of his subject but a practical working manual, and in this he has succeeded.

NOTES AND QUERIES.

THE INFLUENZA PANDEMIC.

The *British Medical Journal* of July 15, 1918, gives the following useful facts which may possess interest for us on this side of the Atlantic at any time:

The influenza that we read so much about in the daily papers seems to have visited almost all the countries in Europe, civilized and barbarian alike. It appears to have been particularly wide-spread in Spain during the month of May; that there were eight million cases of the disease in that country, as was alleged by the French press at the time, is a statement requiring perhaps a grain of salt for deglutition, but certainly pointing to a very heavy incidence. Information reaching this country through Holland indicates that the epidemic has been very prevalent both in Germany and Austria, and it is said that the armies of the Central Powers on the Western Front have suffered severely. Many cases have occurred in the allied armies, and the French civilian population is no more exempt than our own.

The disease among our own people appears to be no more severe, speaking generally, than it is reported to have been in Spain. The onset is often peculiarly sudden, the victim being struck down with dizziness, weakness, and pains in various parts of the body, suddenly while on duty or in the street. There is a sharp rise in temperature to 103° or 104° F., and complaint is chiefly made of headache, pain in the back, and photophobia. The throat feels a little sore, the pharynx is congested, in some cases laryngitis and signs of bronchitis appear. Curiously enough, the sign to which Marris recently drew attention in trench or louse fever—namely, lateral nystagmus with suffusion of the conjunctivæ—has not rarely been found in these influenza patients. In many cases the fever falls in three or four days, and the patient recovers rapidly. In others the course is longer, and the continuance of an irregular pyrexia may be accounted for by bronchitis, or, in rare instances, by capillary bronchitis, bronchopneumonia, or even the discovery of the bacillus of influenza in the circulating blood. Few cases, so far as they are informed, have proved fatal; in some such the cause of death has been acute bronchiolitis with increasing cyanosis and terminal failure of the right heart.

Influenza of the gastrointestinal type has not been common; such a diagnosis is, indeed, by many held to be questionable at any time, and particularly so at the present moment when cases of food poisoning or acute disturbances due to the unusual character of meals nowadays are not infrequently encountered. The many complications and sequelæ by which in times gone by epidemic influenza made itself remembered seem to be happily rare. This circumstance has been held to show that we are not now dealing with an epidemic or a pandemic of influenza at all; but bacteriological evidence is accumulating to prove that the influenza bacillus is respon-

sible for at least a considerable proportion of the cases. Swabs taken from the inflamed pharyngeal surface generally show a varied bacterial flora, perhaps with pneumococci and what at first sight appear to be pneumobacilli predominating, and micrococcus catarrhalis, streptococci, staphylococci, and other microbes as well, but no obvious influenza bacilli. Cultures, however, are said to give grounds for the belief that these pneumobacilli are in many cases influenza bacilli of aberrant type—the organism is notoriously polymorphic—and not the true pneumobacilli of Friedlander at all. It may be added, too, that the pneumococci are in many instances of the saprophytic type, and not pathogenic to guinea-pigs. In other cases the throat swab shows typical groups of influenza bacilli directly, as well as on culture. The incubation period of the disease, a thing not easily to be established in the community at large where so many victims and carriers occur, would seem to be about forty-eight hours or less; at any rate, its spread from bed to bed in hospitals has been observed to take place at that rate.

As for the treatment, bed and the exhibition of some salt of quinine or of aspirin seem to be indicated; the use of gargles appears not to influence the course of the disease, but the free use of aspirin certainly mitigates the patient's discomfort. In the matter of prophylaxis, as in the prophylaxis of cerebrospinal fever, free ventilation is imperative; and after that we come up against the deplorably low standard of public conduct that prevails in the matter of coughing, sneezing, and spitting without the use of a handkerchief. Without doubt the virus of influenza is transmitted from one person to another in the vehicle of droplets of nasal and bucco-pharyngeal mucus, disseminated broadcast in the unguarded spasms of coughing, sneezing, and spitting to which people with coughs and colds, whether influenzal or not, are so objectionably prone. How much better it would be for all of us, and how fatal to the spread of influenza *et hoc genus omne*, if we could all go back to our childhood, and learn once more with the thoroughness engendered by the fear of, say, an instant smacking never to cough or sneeze without first covering both mouth and nose with a handkerchief!

THE REDUCING BODY IN THE CEREBROSPINAL FLUID.

The presence of the normal reducing agent (glucose) in the cerebrospinal fluid has been used as a means of distinguishing meningism from meningitis, in which this body is diminished or absent. Weil has investigated the glucose content of the cerebrospinal fluid in various conditions. In irritation of the meninges and the resulting congestion the amount of glucose in the cerebrospinal fluid is increased, and this holds good in meningism. But when the cause of the irritation is microbic, the fermentative action of the microörganisms reduces the amount of the glucose; this is specially seen in meningococcic meningitis. In tuberculous meningitis diminution in glucose content is the rule; but in some instances the microbic activity is not sufficient to overbalance the influence of meningeal congestion, and at some stages of the disease the glucose content may be almost normal. In syphilitic meningitis the glucose content of the cerebrospinal fluid is excessive, and in explanation it may be suggested either that the spirochæta pallida does not ferment the glucose or that the meningeal reactions of syphilitics are aseptic and secondary to infective processes in the medulla or brain.

In the early stage of cerebrospinal fever, when the fluid is clear and shows a number of mononuclear cells, there may be a preliminary excess of glucose; later this disappears, but as the patient recovers the glucose reappears in the cerebrospinal fluid, increases, and during convalescence may, from the predominance of congestion over bacterial glycolysis, be in excess of the normal, as in the preliminary stage. In epilepsy an excess of glucose is the rule, but in hysterical seizures, however frequent and apparently serious, the glucose content of the cerebrospinal fluid is always normal. In increased intracranial pressure the glucose content is raised, and probably as the

result of irritation of the floor of the fourth ventricle rather than of meningeal hyperemia. In concussion Mestrezat, Bouttier, and Logre describe a characteristic change in the cerebrospinal fluid, which comes on in the course of two or three days and disappears after some weeks or months. This change consists in an excess of cerebrospinal fluid, as shown by high pressure, and increased amount of sugar, associated with an excess of albumin and a smaller number of cells than normal. This characteristic change in the cerebrospinal fluid, found in 80 per cent of the 30 cases examined, is regarded as due to foci of destruction of nervous tissue, with an evidence of meningeal inflammation or infection. Thus there is no leucocytosis or fibrin, and the glucose content is not diminished.—*British Medical Journal*, July 6, 1918.

NURSES CANNOT LEGALLY GIVE ANESTHETICS IN WEST VIRGINIA.

The *Journal of the American Medical Association* of July 20, 1918, states that a decision recently handed down by the Attorney-General of West Virginia holds that the giving of anesthetics constitutes the practice of medicine, and that no person, nurse or otherwise, can legally give anesthetics unless he or she is duly licensed to practice medicine. The decision is as follows:

"Under the law, the right to administer drugs used in surgical anesthesia by a person not a licensed physician would not depend upon either the question of preparation by study or otherwise, or compensation or fees charged for services, but upon the question as to whether or not the administration of such drugs would constitute the 'practice of medicine and surgery' within the meaning of the statutory definition. Is the administration of the anesthetic preparatory to a surgical operation an integral part of the operation itself? I think it is. There are certain things preparatory to a surgical operation necessary to be done that can be trusted to nurses and attendants which are not really a part of the operation itself, and require no great amount of skill to perform. However, an anesthetic is a substance the unskilful handling of which is dangerous to human life. The person undergoing the operation places himself absolutely under the control of the person administering the anesthetic. This is the first dangerous step in the operation—the first one requiring peculiar skill and knowledge. The operating surgeon concentrates his attention to the cutting part of the operation and cannot well exercise careful supervision over the person administering the anesthetic. The anesthetic is such a subtle and dangerous agent that the most careful supervision on the part of the operating physician does not remove the danger of the anesthetic in the hands of an unskilful person.

"If it be held that the administration of anesthetics does not constitute the 'practice of medicine and surgery,' then the fitness of a person to administer them is determined in each case by the operating surgeon. He would constitute the examining tribunal and might choose either a skilled or unskilled person to perform a recognized dangerous part of the operation. I do not believe the legislature ever intended that any person not a licensed physician should be permitted to administer drugs used in a surgical anesthesia, even though such person may act under the direction and in the presence of a licensed physician and surgeon."

"From this opinion it appears that under no circumstances can any person, whether trained nurse or otherwise, administer an anesthetic during a surgical operation unless such person has received a certificate entitling him to practice medicine and surgery. It does not seem likely that the opinion of the Attorney-General would render illegal the administration of anesthetics in obstetrics, since in such cases only partial anesthesia is sought in the great majority of cases. If complete anesthesia becomes necessary, it seems that no one except a licensed physician can legally administer the anesthetic.

"Decisions by attorney-generals of the various States in regard to the giving of anesthetics by nurses are thus far as follows: In Ohio and West Virginia it has been decided that the giving of anesthetics constitutes the "practice of medicine" and requires that the person who gives it must be duly licensed to practice. In Pennsylvania and Wisconsin the decisions were that the nurse could be permitted to give anesthetics. In Kentucky the lower court decided against the nurse, but the higher court reversed the decision, so that Kentucky now lines up with Pennsylvania and Wisconsin. Decisions in other States will be watched with interest."

THE BEGINNING OF DISPENSARIES.

In the *Boston Medical and Surgical Journal* of May 23, 1918, DAVIS and WARNER give an interesting series of facts on this subject. In 1665 the great conflagration which devastated London brought in its fiery train a blessing, for it rid the city of plague. But the germs of poverty cannot be burned up, and the sickness and misery that follow poverty were so apparent to the public-spirited members of the medical profession of London that in 1687 they voted that all members of the College of Physicians, their professional organization, should give their services to the poor without charge. In due form they transmitted this resolution to the Lord Mayor and Aldermen. When, however, the charitable-minded sought to call the good physicians to the service of the poor, no means was found of providing the medicines which the doctors wished to prescribe. The pharmacists of London were at that time organized as a guild, the so-called Apothecaries' Hall; and Apothecaries' Hall would not lower its prices, even when the College of Physicians requested it on behalf of the poor.

The physicians did not sit idle under this monopoly in the prescription market. Fifty-three leading spirits signed an agreement on December 22, 1696, to pay ten pounds apiece to Dr. Thomas Burwell, one of their number, which sum Dr. Burwell was to use for medicines for the poor. Thereupon the first dispensary in the English-speaking world was opened in the building of the College of Physicians.

CORRESPONDENCE.

THE FIRST USE OF WAFERS IN MEDICINE.

To the Editors of the THERAPEUTIC GAZETTE:

SIRS: Did it ever occur to you when drugs were first taken in wafers, or, as our modern use of words would have it, "cachets," or the Hun substitute "cousols"? The other day when preparing some lecture notes I chanced to fall upon a letter of Sir Benjamin Bell, addressed to his mother when he was yet a dresser at the Royal Infirmary at Edinburgh. It bears the date of "25th April, 1770":

"*Dear Mother*—I was in great hopes that before this time you would have got pretty much the better of your headaches, but am extremely sorry to find that I am thus so very much disappointed. . . . In order to render the bark more easily taken, I have herewith sent out a few wafers, which, however, I doubt will not reach you whole. If they do, you take one of them and let it swim a little on the top of a bowl of water till it begins to soften, then put a dose of the powder upon its middle, fold over the sides of it with a spoon, throw it into your mouth, and it will go over of itself without the least taste."

It would seem from the terms in which the letter is couched that the wafer had been recently introduced into practice, but I regret that I am unable to say by whom. The word "wafer" is not in the London Medical Dictionary, London, 1809, edited by Parr.

Perchance some one of your readers may be able to throw some light on this interesting question.

Very truly yours,

CHARLES GREENE CUMSTON,
Prof. Hist. of Medicine, Univ. of Geneva.
GENEVA, SWITZERLAND.